QL
401
.F418
INVZ

THE Festivus

Vol. 52(3) August 2020

The *Altivasum* complex revisited

Fossil *Subpterynotus* from Florida

Landsnails from Indonesia

New gastropods from Brazil

Quarterly Publication of the San Diego Shell Club

ISSN 0738-9388

THE FESTIVUS

A publication of the San Diego Shell Club

Volume: 52 August 2020 ISSUE 3

CLUB OFFICERS

President	Roger Clark
Vice-President	William Schramm
Corresp. Secretary	Dung Vo
Treasurer	John "Duffy" Daughenbaugh
Past President	Lisa Dawn Lindahl

COMMITTEE CHAIRPERSONS

Membership Chair	Diane Thomas
Librarian	Dr. Paul Tuskes
Historian	Dr. Paul Tuskes
Parliamentarian	David B. Waller
Editor in Chief	David P. Berschauer
Editor	David B. Waller
Art Editors	Rex Stilwill & Lisa Dawn Lindahl
Publicity Chair	David P. Berschauer
Botanical Garden Rep.	Dr. Paul Tuskes

MEMBERSHIP AND SUBSCRIPTION
Annual dues are payable to the San Diego Shell Club Membership: Domestic/Foreign $20 (receive e-mail copy of *The Festivus*); Domestic $35 (receive *The Festivus* by mail), Foreign/outside the continental United States $65 (receive a copy of *The Festivus* by mail). Single copies of each regular issue are $10.00 plus postage.

Address all correspondence to:
The San Diego Shell Club, Inc.
P.O. Box 230988, Encinitas, CA 92023

REGULAR CLUB MEETINGS
Club meetings are held on the third Thursday or Saturday of the month, except April, September and December, at either 7:30 p.m. in Room 104, Casa del Prado, Balboa Park, San Diego, or at 12:00 noon at other locations as noticed on the Club's website.

FACEBOOK
https://www.facebook.com/groups/620724271299410/

WEBSITE
http://www.sandiegoshellclub.com
Submit comments or suggestions regarding our website to our Webmaster Dung Vo at dungtranvo@gmail.com.

FRONT COVER:
Subpterynotus gabbi Petuch & Berschauer, 2020, and *S. feliciae* Petuch & Berschauer, 2020. (Cover artistic credit: Rex Stilwill).

MISSION STATEMENT
The San Diego Shell Club was founded in 1961 as a non-profit organization for educational and scientific purposes. More particularly to enjoy, study and promote the conservation of Mollusca and associated marine life through lectures, club meetings and field trips. Our membership is diverse and includes beginning collectors, scientists, divers, underwater photographers and dealers.

THE FESTIVUS is the official quarterly publication of the San Diego Shell Club, Inc. and is issued as part of membership dues in February, May, August and November. *The Festivus* publishes articles that are peer reviewed by our volunteer Scientific Peer Review Board, as well as articles of general interest to malacologists, conchologists, and shell collectors of every level. Members of the Peer Review Board are selected to review individual articles based upon their chosen field of expertise and preference. Available by request or on our website are:

- Guidelines for Authors
- Guidelines for the Description of New Taxa

Submit articles to Editor, David P. Berschauer, at shellcollection@hotmail.com

All correspondence pertaining to articles, including all submissions and artwork should be addressed to the Editorial Board.

ADVERTISING in *The Festivus* is presented as a service to our membership and to supplement publication costs. Advertising does not imply endorsement by the San Diego Shell Club, Inc. or its officers. Advertising space is available at the following rates: Black and White – ½ page $300, ¼ page $150, or ⅛ page $75, Color – ½ page $500, ¼ page $205, or ⅛ page $125. Deadline for submitting advertisements is the 15th of the month prior to publication. Submit advertisements to our Advertising Director David Waller, at: dwaller@dbwipmg.com

UPCOMING CLUB EVENTS: Mark your calendars!
August 21-23, 2020 - 5th Annual West Coast Shell Show (Unfortunately cancelled due to Covid-19 pandemic)

November 21, 2020 - 1:00 p.m. Fall Potluck and Auction (Kratli Collection - legacy auction)

Publication date: July 25, 2020
© San Diego Shell Club, Inc.

ISSN 0738-9388

Volume: 52 THE FESTIVUS ISSUE 3

SMITHSONIAN
DEC 0 2 2022
LIBRARIES

TABLE OF CONTENTS

Peer Reviewed Articles

- A new *Altivasum* Hedley, 1914 (Turbinellidae, Vasinae) from the coast of southern Western Australia 212
  By Merv Cooper and Stephen J. Maxwell
- Description of *Hyalina cunhai*, a new species of Marginellidae (Mollusca: Gastropoda) from the eastern seaboard of Brazil 218
  By Daniel Minior
- The Cone Shells (Gastropoda: Conidae) of the Abrolhos Platform, Brazil, with the Description of Three New Species 224
  By Edward J. Petuch, José Coltro, Jr., and David P. Berschauer
- Two unusual keyhole limpets (Mollusca: Gastropoda: Fissurellidae) from southern California 233
  By Charles L. Powell, II, and Cheryl D. Millard
- A new subspecies of *Papuina antiqua* (Adams & Reeve, 1850) from Yapen Island, Papua, Indonesia 238
  By Jeff Parsons and John Abbas
- Two New Fossil Species of *Subpterynotus* Olsson and Harbison, 1953 (Gastropoda: Muricidae: Muricopsinae) from Southern Florida 245
  By Edward J. Petuch and David P. Berschauer
- A New *Persicula* (Gastropoda:Cysticidae) from Central Brazil 253
  By José Coltro, Jr.
- A new member of the *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) group from Timor-Leste (East Timor) 256
  By Jeff Parsons and John Abbas
- A new subspecies of the *Eugeniconus nobilis* complex from north-western Sumbawa, Indonesia 265
  By Jeff Parsons, John Abbas and Steven Lie
- Taxonomic Note: *Macrocypraea mammoth* Simone & Cavallari, 2020 273

Club News 274

Articles of General Interest

- Editor's Corner - What is with all those "new species"? 275
- Smaller California Record Size Shells 276
  By Roger Evans
- Shell Collecting in Petersburg, Alaska 282
  By Tom Rice
- *Tonicella lineata* (Wood, 1815) - the wonderful lined chiton of the Northeastern Pacific Coast 285
  By Roger N. Clark

ISSN 0738-9388

A new *Altivasum* Hedley, 1914 (Turbinellidae, Vasinae) from the coast of southern Western Australia

Merv Cooper [1] and Stephen J. Maxwell [2]
[1] Perth Shell Distributors, 12 Ambrose Street Rockingham,
West Australia, 6168, Australia. merv@perthshells.com
[2] College of Science and Engineering, James Cook University,
Cairns Qld 4870, Australia stephen.maxwell@my.jcu.edu.au

ABSTRACT This paper presents a new *Altivasum* found off Jurien Bay, Western Australia at 60 m. This new species expands our understanding of the distribution, and in particular extends the northern range of *Altivasum*, in the South-west Marine Region. *Altivasum pauladellaboscae* n. sp. is more rhomboidal than *A. hedleyi* Maxwell and Dekkers, 2019, which is elongated, and has the formation of tubular spines on the shoulder of axial fold on the later whorls of the spire; these spines are not formed in *A. pauladellaboscae* n sp. *Altivasum pauladellaboscae* n sp. differs from *A. profundum* Dekkers and Maxwell, 2018 in having acute shoulder nodules. The South Australian, *A. flindersi* Verco, 1914 lacks the fibriated subsutural band found in *A. pauladellaboscae* n. sp. *Altivasum clarksoni* Maxwell and Dekkers, 2019 is geographically isolated and morphologically distinct, being more elongated and fibriated. This paper brings the number of described *Altivasum* species to five.

KEY WORDS *Altivasum*, *A. pauladellaboscae*, Western Australia.

INTRODUCTION

The South-west Marine Region is a bioregion identified for its significant and diverse subtropical and temperate faunal composition (Commonwealth of Australia, 2012). The description of the new species below completes the northern range of *Altivasum* within the Western Rock Lobster Ecological Zone of the South-west Marine Region. This northern section was hitherto without any *Altivasum* data (Abbott 1959; Dekkers and Maxwell, 2018; Maxwell and Dekkers, 2019). Within the Western Rock Lobster Ecological Zone, *Altivasum* is currently divided into two species, a shallow water *A. hedleyi* Maxwell and Dekkers, 2019 and a deep water *Altivasum profundum* Dekkers and Maxwell, 2018, to this a new species in added, which has a depth preference that falls between these two species.

The southern and eastern areas of the South-west Marine Region contains: *A. hedleyi* Maxwell and Dekkers, 2019 in the shores adjacent to the Albany Canyon group complex ecological zone; *Altivasum clarksoni* Maxwell and Dekkers, 2019 in the Recherche Archipelago ecological zone; and *A. flindersi* Verco, 1914 from the central gulf and Kangaroo Island Pool ecological zone. The South-west Marine Region is unique in that it holds all the known *Altivasum* species.

METHODS

Cray fisheries are an important component of the Western Australian economy. However, there is also a role for this fishery to act as citizen scientists, particularly when dealing with one aspect of the by-catch, being on the lookout for unusual shells occupied by hermit crabs. The distribution of Western Australian *Altivasum* complex falls within the western rock lobster ecological zone (Commonwealth of Australia, 2012; Dekkers and Maxwell, 2018; Maxwell and Dekkers, 2019). The examples of the species being circumscribed in this paper were obtained as by-catch from cray-fisherman. The new species is described based on shell morphology and is compared to existing members of the *Altivasum* complex.

SYSTEMATICS

Superfamily: Turbinelloidea Rafinesque, 1815
Family: Turbinellidae Swainson, 1835
Subfamily: Vasinae Adams and Adams, 1853

Altivasum Hedley, 1914

Type Species. *Latirus aurantiacus* Verco, 1895 (= *Altivasum flindersi* Verco, 1914).
Synonymy. *Altivasum* Hedley, 1914, p. 68. Dekkers and Maxwell 2018, p. 246. Maxwell and Dekkers, 2019, p. 171. = *Vasum* (*Altivasum*) Hedley - Wenz 1946, p. 1300. Abbott 1950, p. 213. Abbott 1959, p. 25. Wilson 1994, p. 60.
Assigned Taxa.

- *Altivasum clarksoni* Maxwell and Dekkers, 2019 (p. 172)
- *Altivasum flindersi* Verco, 1914 (p. 69)
- *Altivasum hedleyi* Maxwell and Dekkers, 2019 (p. 172)
- *Altivasum profundum* Dekkers and Maxwell, 2018 (p. 251)

Altivasum pauladellaboscae Cooper and Maxwell, new species
(Figures 1A, B)

Description. A medium sized rhomboidal *Altivasum* that possesses a uniformly fibriated subsutural band and not dissimilar to a hand-grenade in form. The shell is very heavy and solid. The teleoconch has 10-11 axial nodes that do not develop spines until the final body whorl. Furthermore, teleoconch is decorated with four or five strong spiral cords that have finer threads in the inter-spaces. The suture is wavy and distinct. The shoulder of the body whorl has large axial folds that are nodulated with short open tubular spines. The axial folds are transgressed by strong cords that periodically give rise to short tubular scales at on the peak of the axial fold. The aperture is ovate and the lower columella bears there plicates. The operculum is of a tear drop in shape.

Type Material. Holotype – WAMS No. 29953, Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (to be deposited in the Western Australian Museum), height 128.2 mm (Figure 1A). Paratype – Jurien Bay, Western Australia, taken in cray fish pot at a depth of 60 m (Merv Cooper collection), height 129.3 mm (Figure 1B).

Type Locality. Jurien Bay, Western Australia, at a depth of 60 m.

Etymology. Named in honour of Paula Della Bosca. Paula was the partner of Merv Cooper in Perth Shell Distributors (sadly she passed away on 15th April 2018; she was a dedicated shell collector in the field; Figure 2).

Remarks. At present, the precise distribution of *Altivasum pauladellaboscae* new species is not known, recent examples have been taken off Jurien Bay at 60 m, but it known to range as far south as Rockingham (Figure 3). Live taken specimens are always camouflaged with coral growths and seaweed. This record expands our understanding of the distribution, in particular, *A. pauladellaboscae* extends the northern range of the *Altivasum*, and this encapsulates the remaining Western Australian area in the South-west Marine Region remaining without an *Altivasum* species (Dekkers and Maxwell 2018; Maxwell and Dekkers 2019; Figure 3).

The two species that abut the distribution of *A. pauladellaboscae* come from different depths and locations, but are taxa found further to the south (Figure 3). *A. pauladellaboscae* differs from *A. hedleyi* Maxwell and Dekkers, 2019 in being more rhomboidal over the elongation of *A. hedleyi*. Furthermore, *A. hedleyi* can be differentiated by the much more ornate spire and formation of tubular spines on the shoulder of axial fold, these spines are not formed in *A. pauladellaboscae*. While *A. pauladellaboscae* and *A. hedleyi* share a final body whorl that may be spinose, this is typically greatly diminished in *A. pauladellaboscae* not reaching the relative large size of those in *A. hedleyi*.

Altivasum pauladellaboscae differs from *Altivasum profundum* Dekkers and Maxwell, 2018 in lacking the delicacy of that species: *A. pauladellaboscae* has shoulder nodules that are more acute than in *A. profundum* that does not possess the tubular spines of both *A. pauladellaboscae* and *A. hedleyi*.

The South Australian, *A. flindersi* Verco, 1914 lacks the fibriated subsutural band found in the Western Australian species. The small *A. clarksoni* Maxwell and Dekkers, 2019 differs in being much smaller, and has a much finer sculptural form than the smoother and coarsely ornamented shell of *A. pauladellaboscae*.

DISCUSSION

The naming of this new *Altivasum* brings the total number of species in that genus to five (Figure 3). The recent taxonomic expansion of the *Altivasum* complex has enabled a greater understating of the radiation to be enunciated. In particular, *A. pauladellaboscae* shares many similarities to both, *A. profundum* and *A. hedleyi*, and acts as a marker upon which to discuss the evolution within the *Altivasum* complex. All three species have differing depth profiles and it is the difference in depth profile that is of great interest (Dekkers and Maxwell 2018). *Altivasum pauladellaboscae* is a mid-depth species If we accept this with the shifts in sea-level and interglacial oscillations, then the modern shallow water taxa must have shared ancestry with the deep water sister taxa. The new species provides a marker to further the ability to formulate an evolutionary hypothesis for the radiation of the *Altivasum* complex: how the shallow watered *A. hedleyi* arose from the shared ancestor with the deeper watered *A. profundum* (Dekkers and Maxwell 2018).

LITERATURE CITED

Abbott, R.T. 1950. The genera *Xancus* and *Vasum* in the western Atlantic. Johnsonia, 2:201-219.

Abbott, R.T. 1959. The family Vasidae in the Indo-Pacific. Indo-Pacific Mollusca 1:15-32.

Commonwealth of Australia, 2012. Marine bioregional plan for the South-west Marine Region prepared under the Environment Protection and Biodiversity Conservation Act 1999. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Dekkers, A.M. & S.J. Maxwell. 2018. *Altivasum* Hedley, 1914 (Gastropoda: Turbinellidae) from South Western Australia. The Festivus 50:245-255.

Hedley, C. 1914. Zoological Results of the Fishing Experiments Carried Out by F.I.S. Endeavor 1909-10 under H.C. Dannevig, Volume 2 Part 2. Melbourne, Commonwealth of Australia.

Maxwell, S.J. & A.M Dekkers. 2019. A new name for *Altivasum typicum* Hedley, 1916 fide Dekkers and Maxwell, 2018 and the description of *Altivasum clarksoni* nov. sp. The Festivus 51:171-176.

Verco, J.C. 1895. Description of new species of marine Mollusca of South Australia.

Transactions of the Royal Society of South Australia. 19:84-94.

Verco, J.C. 1914. Annual Meeting October 1914-Miscellaneous Notes. Transactions and Proceedings and Reports of the Royal Society of South Australia. 38:483-484.

Wenz, W. 1946. Handbuch der Paläozoologoie 6. Berlin, Gebruder Borntraeger.

Wilson, B. 1994. Australian Marine Shells 2: Prosobranch Gastropods part two Neogastropods. Kallaroo. Odyssey Publishing.

Figure 2. Paula Della Bosca.

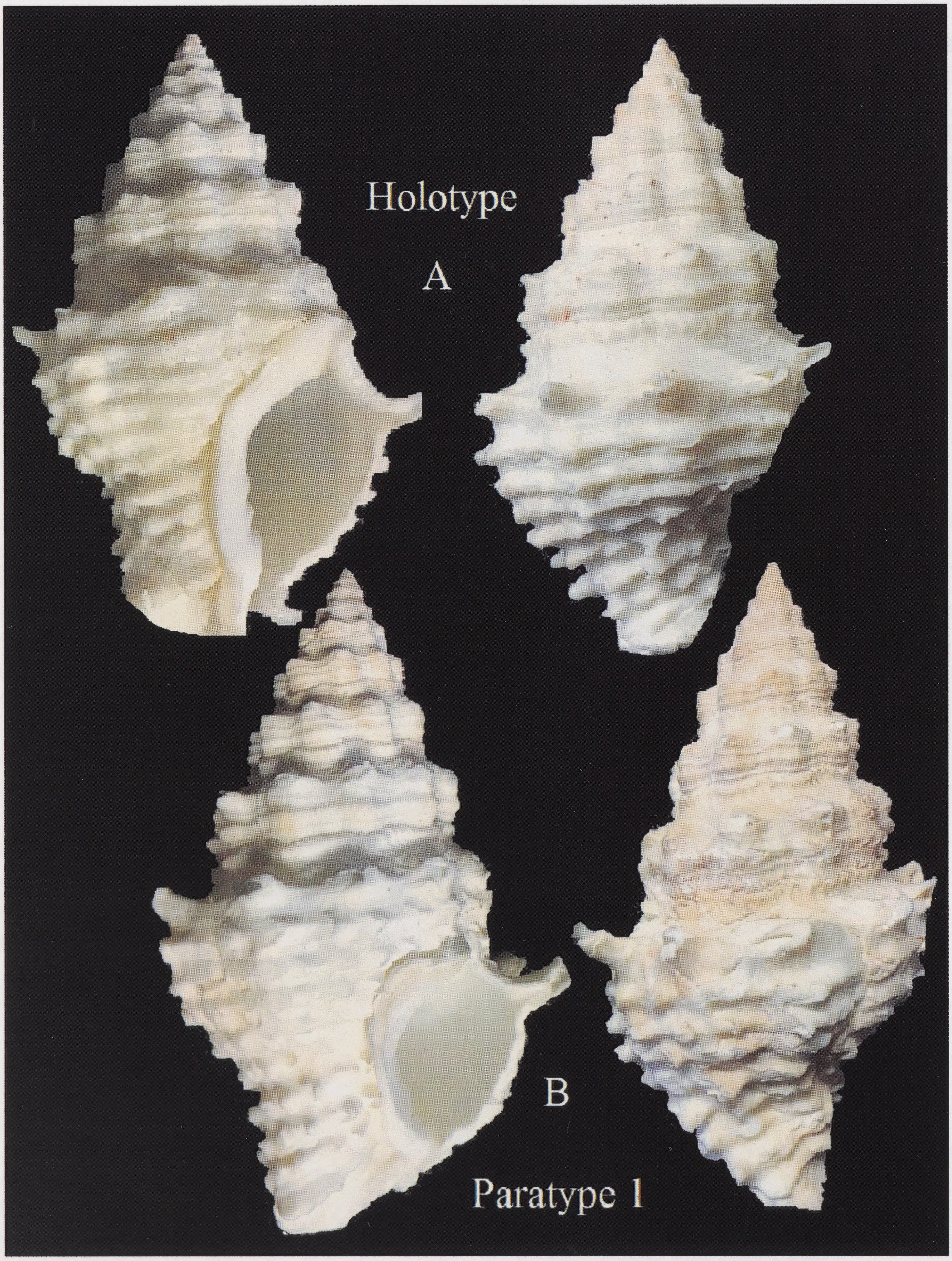


Figure 1. A= *Altivasum pauladellaboscae* – Holotype – Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (deposited in the Western Australian Museum, WAMS No. 29953), height 128.2 mm; **B=** *Altivasum pauladellaboscae* – Paratype 1 – Jurien Bay, Western Australia, taken in cray fish pot at a depth of 60 m (Merv Cooper collection), height 129.3 mm.

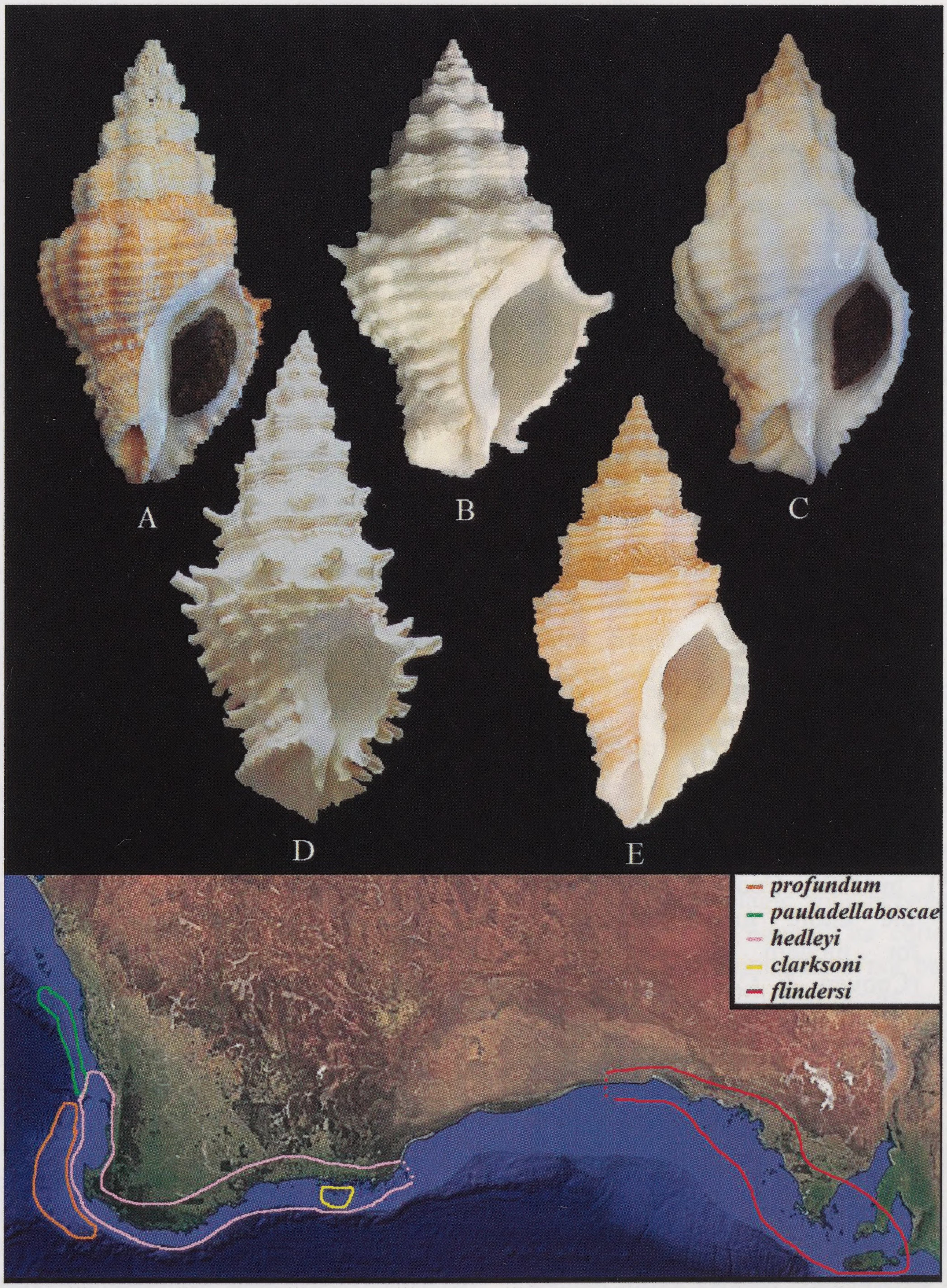


Figure 3. The current *Altivasum* Hedley, 1914 taxa showing there known distributions: **A=** *A. flindersi* Verco, 1914, Port Lincoln, South Australia, dived 10-20 metres in gravelly sand gutters (MNHN IM-2014-6965), height 110.3 mm; **B=** *A. pauladellaboscae* Jurien Bay, Western Australia, taken in crayfish pot at a depth of 60 m (deposited in the Western Australian Museum, WAMS No. 29953), height 128.2 mm; **C=** *A. profundum* Dekkers and Maxwell, 2018, off Augusta, West Australia, ROV collected at 162 m, (WAMS No. 72381), height 77.0 mm; **D=** *A. hedleyi* Dekkers and Maxwell, 2019, Esperance, Western Australia (Weinreich collection), height 222.0 mm; **E=** *A. clarksoni* Dekkers and Maxwell, 2019, Esperance, Western Australia, 30 m by diver (Collection of Trevor and Marguerite Young), height 62.0 mm.

ISSN 0738-9388

Description of *Hyalina cunhai*, a new species of Marginellidae (Mollusca: Gastropoda) from the eastern seaboard of Brazil

Daniel Minior
3406 Belle Meade Dr. NW, Wilson, NC 27896
danminior@hotmail.com

ABSTRACT A new species of the marginellid genus *Hyalina* is described from Brazil. The new species *Hyalina cunhai* is compared to four other western Atlantic *Hyalina* species, including *H. avenacea* Deshayes, 1844, *H. moolenbeeki* Espinosa & Ortea, 2012, *H. pallida* Linnaeus, 1758, *H. tenuilabra* Tomlin, 1917, and five western Atlantic *Volvarina* species, including *V. adrianadiae* Cossignani, 2006, *V. affinis* Reeve, 1865, *V. brasiliana* Boyer, 2000, *V. frazzinii* Cossignani, 2006 and *V. lactea* Kiener, 1841. When compared to these similar species, *H. cunhai* varies from them with distinct differences in body shape, spire, lip, and body ornamentation.

KEYWORDS Marginellidae, *Hyalina*, *Hyalina cunhai, Volvarina*, Brazil, new species.

INTRODUCTION

Our collective understanding of the Brazilian marginellids of genera *Hyalina* and *Volvarina* continues to evolve. Previously, Bavay had done the most work in the family in beginning of the 20th century (Boyer, 2000). E.C. Rios summarized the Brazillian marginellids in 1985 (Rios, 1985). In 1995, Coovert and Coovert reorganized the entire group creating a framework for modern organization of marginellids (Coovert & Coovert, 1995). In 2000, Boyer disputed some of Rios's conclusions, revised the family, and clarified Bavay's works (Boyer, 2000). In 2006, Cognissani created the most expansive work to date cataloging world marginellids, listing 13 species of *Volvarina* and 3 species of *Hyalina* in the waters off Brazil. In the past few years, the scientific knowledge for these families has grown with several new species being named, but it is expected that many more marginellid species are still to be discovered along the thousands of kilometers of Brazilian coastline (Boyer, 2000). Despite recent discovery and identification of several new species of Southern Atlantic and Caribbean *Hyalina*, the genus *Hyalina* remains poorly documented.

Pacific and South African marginellid demonstrate broad diversity. Many new species have been discovered and named in the past 20 years. It is expected that marginellid of the Caribbean and Western Atlantic off the coast of tropical South America will demonstrate diversity as well. There are several reasons why diversity is expected in worldwide marginellid populations. Marginellid are small, have limited locomotive ability, and do not travel expansively. This creates isolated gene pools. In addition, many marginellid are thought to reproduce with a pediveliger stage instead of a planktonic larval stage (Lussi, 2013). Like other gastropods with pediveliger stages, distribution does not occur through ocean currents. Limited physical mobility and limited reproductive mobility likely lead to many small diverse populations. It has also been hypothesized that many species have evolved to have highly specific ecological requirements (Lussi, 2013). This may further limit their ability to survive in wide geographic ranges.

Collection and identification of new species of marginellids has been slow for several reasons. With the incredible diversity of the natural world, naming initially focused on larger shells. As time has gone on and more and more large species have been identified, smaller species come into focus. Several other factors impair collection and identification, like deep water locations, danger of diving at depths due to sharks, rough seas, and difficult weather conditions. Beyond diving range, collecting at depth remains difficult due to lack of infrastructure for dredging equipment, cost of dredging, dredge imprecision, and limited dredge size (Veldsman & Veldsman, 2017).

All specimens analyzed in this study were obtained from the collection of Dr. Carlo Magenta da Cunha who obtained them from a deep water petroleum research vessel in 2016.

ABBREVIATIONS

MZUSP – Zoological Museum of Sao Paulo University

SYSTEMATICS

Family MARGINELLIDAE Fleming, 1828
Subfamily MARGINELLINAE Fleming, 1828
Genus *Hyalina*, Schumacher, 1817
Type Species: *Hyalina pallida* (Linnaeus, 1758)

Hyalina cunhai Minior, new species
(Figures 1A-L)

Description. Shell size small for genus, average size 6.4 mm, ranging 6.3 to 6.5 mm; shell shape ovate, tapering at both ends, fragile build; surface porcellaneous with fine malleations; shell opacity translucent to partially translucent; shoulder rounded, uncallused, and terminates on last body whorl; spire low, convex, with faint radial blotches on some specimens, with convex sutural ramping; aperture wider at base than near shoulder; oblique columellar plications, numbering 3-4; lip slightly flexuous, inflected, uniformly thin; no labial dentition; background color uniform cream, light orange, or white; faint translucent striations on dorsum when viewed under lower light intensities, otherwise no pattern.

Type Material. Holotype: 6.5 x 3.3 mm. Donated to Collection MZUSP – Zoological Museum of São Paulo University. Paratypes: Paratype 1 = 6.5 x 3.3 mm, Coll. D. Minior; Paratype 2 = 6.5 x 3.3 mm, Coll. D. Minior; Paratype 3 = 6.3 x 3.1 mm, Coll. D. Minior.

Type Locality. Brazil, off Santos, São Paulo State, dredged at 250-300 meters.

Distribution. Shells have been collected off Santos, São Paulo State, Brazil. This is so far the only known locality.

Etymology. This species is named for Dr. Carlo Magenta da Cunha from whom the original specimens were obtained.

Differential Diagnosis. This species is from the deep water mesopelagic zone between 250-300 meters, which has limited its collection. The soft parts of the animal have not been studied. Accessing its anatomy and radula would further clarify its status. It superficially resembles some other endemic Brazilian deep water marginellid previously described but distinct differences can be found on close examination. Below is a differential diagnosis of the new species *Hyalina cunhai* compared to morphologically similar looking species.

- ***Hyalina avenacea*** Deshayes, 1844 - *H. cunhai* is more ovate with a less pronounced spire. (Figure 2A)

- ***Hyalina moolenbeeki*** Espinosa & Ortea, 2012 - *H. cunhai* has a more pronounced spire, larger sutural spacing, and does not have central body banding. (Figure 2B)

- ***Hyalina pallida*** Linnaeus, 1758 - *H. cunhai* is more ovate and less cylindrical in structure, has less flaring of the lip toward the base, and is more consistently opaque. (Figure 2C)

- ***Hyalina tenuilabra*** Tomlin, 1917 - *H. cunhai* is more ovate, has a less pronounced spire, and does not have the faint banding seen in *H. tenuilabra.* (Figure 2D)

- ***Volvarina adrianadiae*** Cossignani, 2006 - *H. cunhai* has a longer spire, a thinner, less flexuous lip, has faint body striations, and more variability in color. In *H. cunhai*, the last body whorl ends on the body instead of the spire. (Figure 2E)

- ***Volvarina affinis*** Reeve, 1865 - *H. cunhai* is smaller, narrower at mid body, has a uniformly thin lip, which is not thickened at its mid-point. It does not have faint, broad body stripes as seen in *V. affinis*. (Figure 2F)

- ***Volvarina brasiliana*** Boyer, 2000 - *H. cunhai* has a wider body structure, has a less pronounced spire, and does not have stripes. (Figure 2G)

- ***Volvarina frazzinii*** Cossignani, 2006 - *H. cunhai* is smaller, has a wider body at its anterior end, and does not have as pink a coloration. In *H. cunhai*, the last body whorl ends on the body instead of the spire. (Figure 2H)

- ***Volvarina lactea*** Kiener, 1841 - *H. cunhai* is more opaque, has a shorter, less conical spire, larger columellar plicae, body striations, and does not have body stripes. (Figure 2I)

DISCUSSION

The new species *Hyalina cunhai* can grossly be placed within the tribe Prunini based on shell morphology. Within Prunini, the classification becomes more difficult. The genus was originally assumed to be *Volvarina*, however upon further analysis it belongs in the genus *Hyalina.*

Hyalina are in general small, non-patterened, non-aesthetically pleasing, and have been largely ignored by main stream conchologists. They are sparsely covered in the literature with the most accessible work being done by Cooverts between 1970 and 2000. Creating confusion in the taxonomy of this new species, the classification of *Volvarina* and *Hyalina* over the past 200 years demonstrates the two different genera being applied to a large spectrum of overlapping morphologies. It seems that naming of Prunini in the 1800's and early 1900's occurred before in-depth malacological understanding of their differences, likely leading to misclassifications.

Based on shell morphology *Volvarina* are grossly more narrow and cylindrical, have a more pronounced spire, a thicker shell, 4 to 5 columellar plicae, thickening of the mid aspect of the lip and a slight inflection of the midpoint of the lip. In contrast, *Hyalina* have a thinner shell, are more ovate, have a reduced spire, and in general, fewer columellar plicae (usually 2-3). Further differentiation becomes more difficult without analysis of the animal. More accurate differentiation would require examination of the soft tissue parts. *Volvarina* often have a pustulose mantle and the type 6 radula common in Prunini. *Hyalina* have an esophageal caecum like *Volvarina*, but demonstrate loss of the radula, buccal mass, and buccal pouch.

With gross analysis of shell morphologies in the modern literature of the shells of both genera many *Volvarina* could be *Hyalina,* and some *Hyalina* could be *Volvarina*. Taxonomy in these genera need revision. It is likely that with further analysis upon revision, the more narrow, thicker, spired shells will be placed within the genus *Volvarina* and the thinner, more ovate, low spired shells will be placed in the genus *Hyalina*. Based on this analysis the new species *Hyalina cunhai* is placed within the genus *Hyalina*.

ACKNOWLEDGMENTS

The author thanks Marcus and Jose Coltro who procured the specimens from Dr. Magenta da Cunha, offered editorial advice, and for the use of their photographs of comparison species in this manuscript. Further thanks are given to Dr. Luiz Ricardo L. Simone, Ph.D. of the Museu de Zoologia da Universidade de São Paulo for his gracious review and editorial input. Finally, thanks to Brian Hayes and Jan Neefs for their support, advice, review, editorial input, and networking help.

LITERATURE CITED

Boyer, F., 2000. The genus *Volvarina* (Volutacea: Marginellidae) in Brazil. Part 1: revision of the species described by A. Bavay, and closely related species. Novapex 1(2):35-55.

Coovert, G.A. and H.K. Coovert. 1995. Revision of the Supraspecific Classification of Marginelliform Gastropods. The Nautilus 109(2&3):43-110.

Cossignani, T., 2006. Marginellidae and Cystiscidae of the World. L'Informatore Piceno, Ancona, Italy, pages 149-215.

Lussi, M., 2013. Description of six new species of MARGINELLIDAE from off the eastern seaboard of South Africa with notes on comparable species GASTROPODA: NEOGASTROPODA: MURICOIDEA). Malacologia Mostra Mondiale. 81:18-24.

Rios, E. de C., 1985. Seashells of Brazil. MuseoOceanographico de Rio Grande do Sul; 329 p., 102 pls.

Veldsman, S., and V. Veldsman. 2017. Guide to the Southern African *Marginella*. Institute for Marine and Environmental Science, Pretoria, South Africa, page 3.

ADDITIONAL REFERENCES

Boyer, F., 2001. Two *Volvarina* (Marginellidae) from deep waters off Northern Honduras. Novapex 2(1):3-8.

Gracia, A. and Boyer, F., 2004. Distribution of *Volvarina hennequini* Boyer, 2001 in the Western Caribbean Sea and description of a new bathyal *Volvarina* from Northern Colombia. Novapex 5(2-3):79-84.

Rios, E. de C. and Leal, J., 1993. *Volvarina pontesi*, a new bathyal marginellid (Mollusca, Gastropoda) from off Brazil. Apex 8(1-2):27-30.

Roth, B. and Clover, P., 1968. A Review of the Marginellidae Described by Bavay, 1903-1922. The Veliger 16(2):207- 215.

Wakefield, A. and McCleery, T., 2005. Two new *Volvarina* (Marginellidae) from offshore subtidal habitats in Northern Panama. Novapex 6(3):45-52.

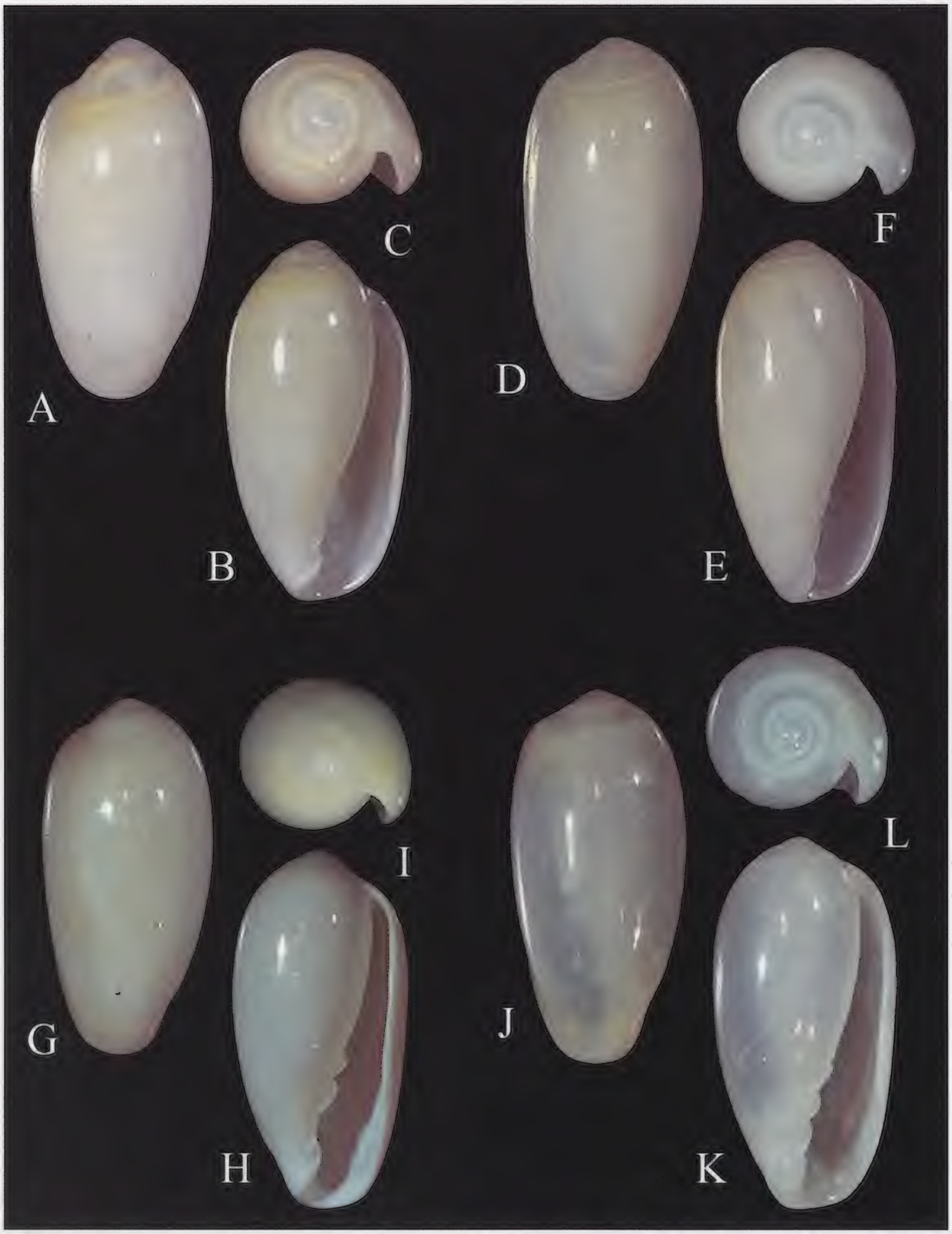


Figure 1. *Hyalina cunhai* new species. **A-C** = Holotype, 6.5 mm in length (MZUSP – Zoological Museum of São Paulo University); **D-F** = Paratype 1, 6.5 mm in length (Coll. D. Minior); **G-I** = Paratype 2, 6.3 mm in length (Coll. D. Minior); **J-L** = Paratype 3, 6.3 mm in length (Coll. D. Minior).

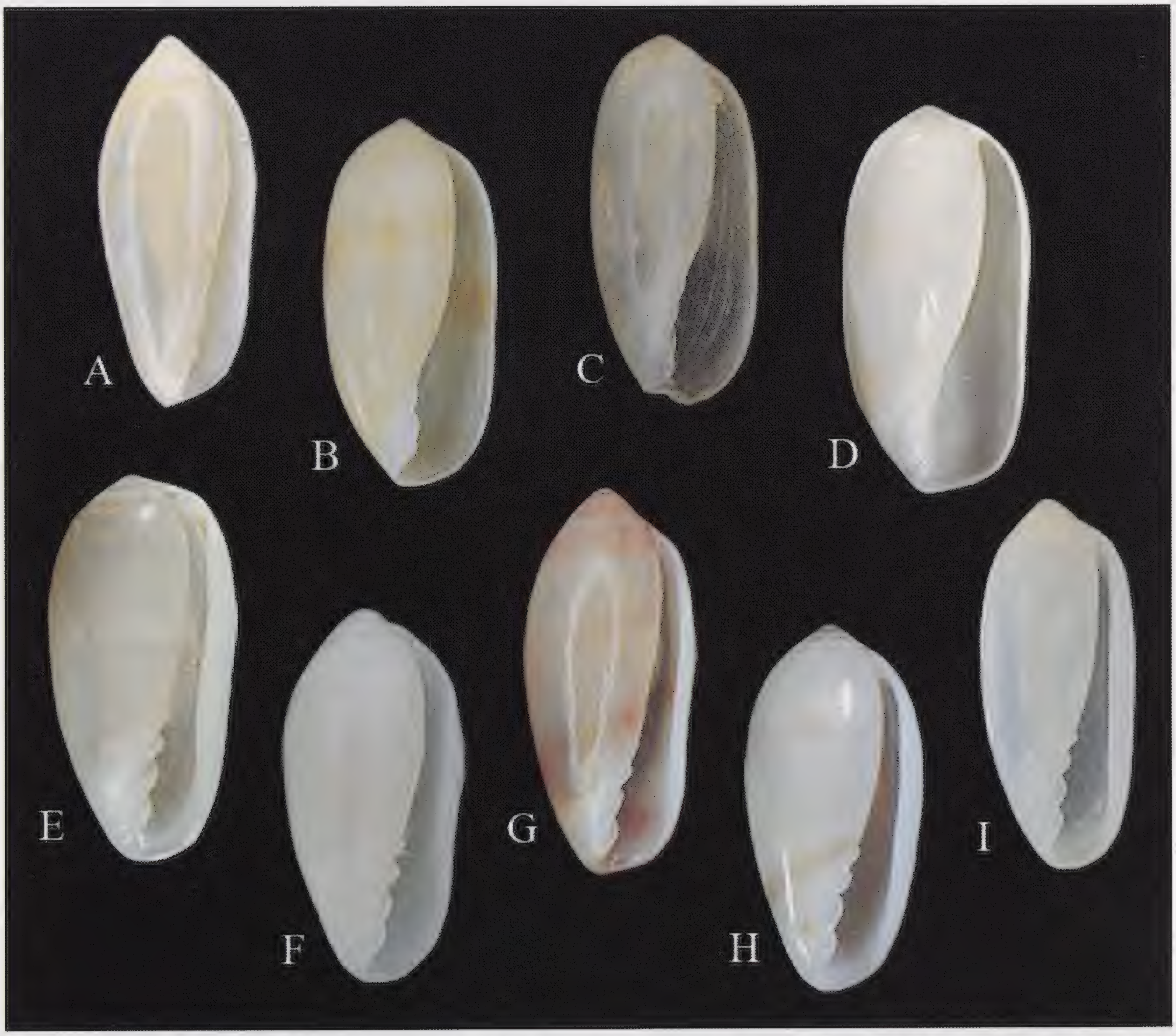


Figure 2. Comparison species in the genera *Hyalina* and *Volvarina*. **A=** *Hyalina avenacea* Deshayes, 1844, 8.3 mm in length (image from Femorale); **B=** *Hyalina moolenbeeki* Espinosa & Ortea, 2012, 13.7 mm in length (image from Femorale); **C=** *Hyalina pallida* Linnaeus, 1758, 9.0 mm in length (image from Femorale); **D=** *Hyalina tenuilabra* Tomlin, 1917, 12.8 mm in length (image from Femorale); **E=** *Volvarina adrianadiae* Cossignani, 2006, holotype 6.5 mm in length (image from *Malacologia Mostra Mondiale* 50:15-17, at p. 16); **F=** *Volvarina affinis* Reeve, 1865, 7.1mm in length (image from Femorale); **G=** *Volvarina brasiliana* Boyer, 2000, 7.7 mm in length (image from Femorale); **H=** *Volvarina frazzinii* Cossignani, 2006, 7.0 mm in length (image from Femorale); **I=** *Volvarina lactea* Kiener, 1841, 10.5 mm in length (image from Femorale).

ISSN 0738-9388

Volume: 52 THE FESTIVUS ISSUE 3

The Cone Shells (Gastropoda: Conidae) of the Abrolhos Platform, Brazil, with the Description of Three New Species

Edward J. Petuch [1], José Coltro, Jr. [2], and David P. Berschauer [3]

[1] Department of Geosciences, Florida Atlantic University, Boca Raton, Florida 33431
epetuch@fau.edu
[2] Femorale São Paulo, São Paulo, SP, Brazil
shells@femorale.com
[3] 25461 Barents Street, Laguna Hills, California 92653
shellcollection@hotmail.com

ABSTRACT Three new species of cone shells, in the genera *Coltroconus*, *Jaspidiconus*, and *Poremskiconus*, have been discovered on the Abrolhos Platform off central Brazil. These new taxa, *Coltroconus valianti* n. sp., *Jaspidiconus carlagrezziae* n. sp., and *Poremskiconus uhlei* n. sp. are restricted to the coral reef environments of the central platform area and are the newest additions to a highly-endemic localized conid fauna comprising 17 known species.

KEY WORDS *Coltroconus, C. valianti, Jaspidiconus, J. carlagrezziae*, *Poremskiconus, P. uhlei*, Conidae, Abrolhos Platform, Abrolhos Archipelago, Brazil

INTRODUCTION

The Abrolhos Platform is a roughly-rectangular widening of the central Brazilian continental shelf, covering over 46,000 square km. The main part of the platform extends from southern Bahia State to northern Espirito Santo State, and eastward approximately 280 km into the open South Atlantic. The main platform (sometimes referred to as the Abrolhos Bank) is contiguous with the smaller Royal Charlotte Bank to the north and also with two chains of adjacent seamounts, the Minerva Seamount complex along the north and the Vitoria Seamount complex along the south (Figure 1). The platform is covered with literally hundreds of isolated scleractinian coral and coralline algal reef complexes, making this the farthest-south major system of coralline environments found in the Atlantic Ocean. The molluscan biodiversity of the Abrolhos reef complexes is still virtually unknown, but recent preliminary studies have indicated that the platform houses unusually high levels of both species-richness and endemism, especially in the family Conidae (Petuch, 2013: 157-160; Petuch and Berschauer, 2018: 27-30; 2019: 222-223).

Unlike the adjacent coastal areas of Bahia State, the Abrolhos Platform contains a larger variety of marine habitats, with four main biotopes dominating the region: 1. Coralline algal knolls (rhodoliths) and micro-atolls; 2. Reefs and bioherms composed of stony coral and hydrocoral assemblages, with only four endemic scleractinians (*Mussismilia brasiliensis*, *M. harttii*, *M. hispida*, and *Favia leptophylla*) and two endemic hydrocorals (*Millepora braziliensis* and *M. nitida*) being present (Leão, *et al.*, 2003); 3. Carbonate sand and mud sea floors, mixed with coral rubble, mainly between the reef complexes; and 4. Basaltic rock shorelines on the five volcanic islands of the Abrolhos Archipelago, 53 km offshore. These four habitat types, inter-fingering across the shallow platform, support the richest molluscan fauna found anywhere along the Brazilian coast. A preliminary survey of Abrolhos taxa (conducted by the senior author and presently unpublished) shows that over 400 species of mollusks are now known from the platform, offshore islands, and seamounts, with approximately 15% being endemic to the area. In the case of the family Conidae, fully 100% of the species present were found to be restricted to the Abrolhos Platform area, demonstrating that they have the highest level of endemism of any gastropod family found on these reef complexes, seamounts, and islands.

The senior author was fortunate enough to be able to accompany a Brazilian marine geologist (Dr. Zelinda Leão, University of Salvador) during her doctoral research on the Abrolhos Platform in 1977, and was the first malacologist ever to conduct a comprehensive survey of the Abrolhos molluscan fauna. This three month survey, conducted on the Timbebas, Pedra Lixa, Guaratibas, Parcel das Paredes, Coroa Vermelha, and Viçosa Reefs and the offshore Abrolhos Archipelago volcanic islands, resulted in the description of ten new gastropods and two new genera (Petuch, 1979; 2013). Since that time, whole teams of dedicated young Brazilian scientists have begun to explore the islands and

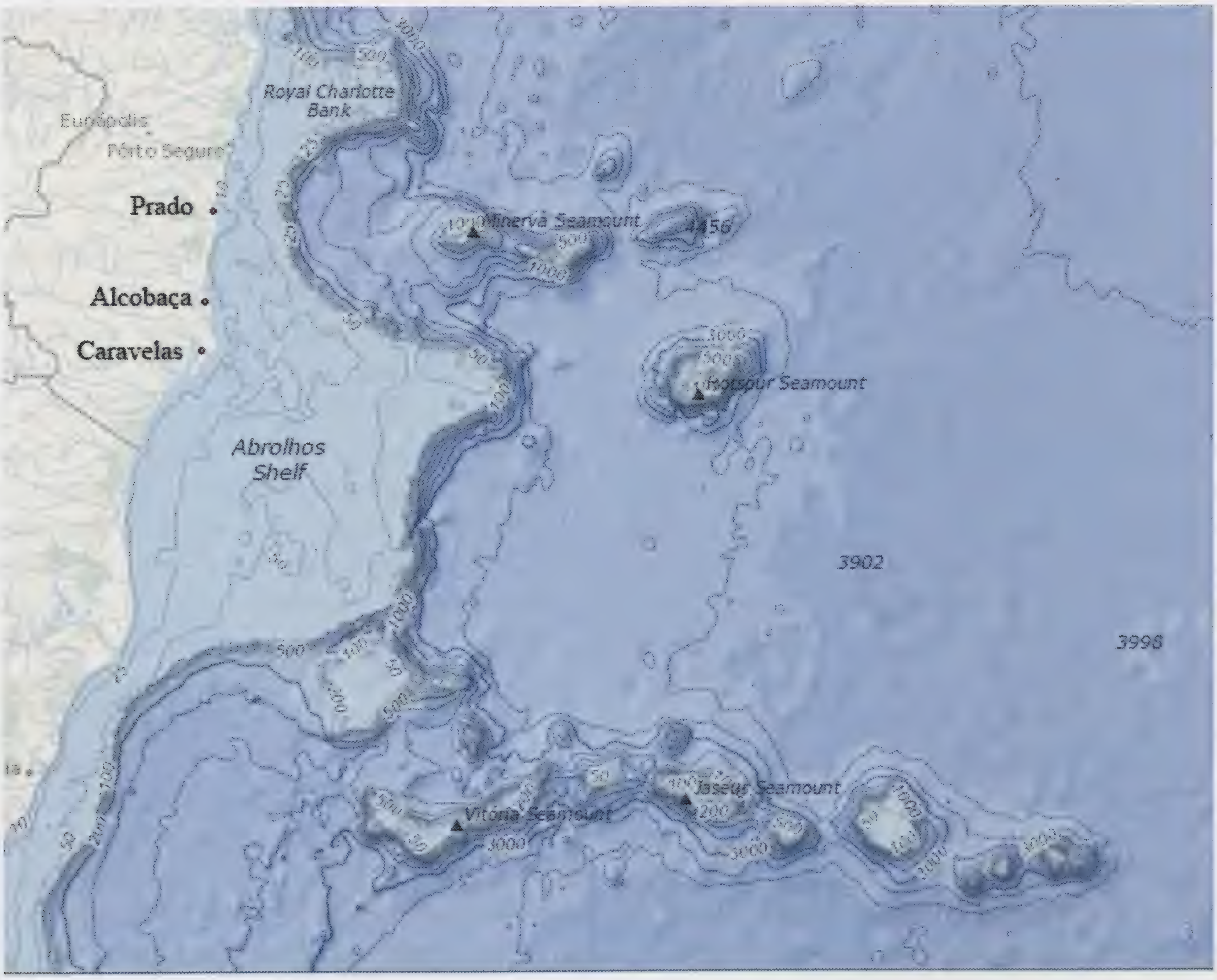


Figure 1. Map showing the Abrolhos Platform off the coasts of southern Bahia State and northern Espirito Santo State, Brazil, along with the contiguous Royal Charlotte Bank and the two main chains of adjacent seamounts. This area is now known to house 17 endemic species of cones shells, and also the endemic genus *Coltroconus*.

reefs of the Abrolhos Platform and have discovered many additional new gastropod taxa, including new species of cones, muricids, volutes, buccinids, and fasciolariids. The second author of this paper also discovered and named five new Abrolhos cone shells in a previous work (Coltro, 2004). Recently, we were presented with three new cone species from the Abrolhos Platform and these are described in the following section. The new taxa demonstrate that a total of 17 endemic cone shells are now known to occur on the platform and adjacent seamounts and these are listed at the end of this paper.

SYSTEMATICS

Class Gastropoda
Subclass Sorbeoconcha
Order Prosobranchia
Infraorder Neogastropoda
Superfamily Conoidea
Family Conidae
Subfamily Conilithinae
Genus *Coltroconus* Petuch, 2013
(Type species: *Coltroconus iansa* (Petuch, 1979))

Coltroconus valianti Petuch, Coltro, and Berschauer, new species
(Figure 2A, B)

Description. Shell of average size for genus, stocky and broad, proportionally wide across shoulder, with elevated, subpyramidal spire; shoulder sharply-angled, ornamented with 12-14 large, rounded knobs; spire whorls slightly scalariform, with heavily coronated early whorls; body whorl smooth and polished, ornamented with 12-14 large, flattened cords and deep grooves around anterior one-half; numerous very faint grooves present on posterior one-half of body whorl; base shell color deep yellow-orange with wide pale yellow band just anterior of mid-body line; lighter band bordered on either side by band of darker tan-orange color; faint pale yellow zig-zag markings present on mid-body band; shoulder knobs and anterior tip pale yellow; early whorls and protoconch white; aperture proportionally wide, deep yellow within; protoconch bulbous, mamillate, rounded, composed of two whorls.

Type Material. HOLOTYPE - length 12.4 mm, width 6.6 mm, Recife de Arengueira, Abrolhos Platform, Brazil, MZSP 152148 (Figure 2A, B); PARATYPES - Lengths 10 mm and 12.2 mm, same locality and depth as the holotype, in the Petuch research collection; length 10.8 mm, same locality and depth as the holotype, in the Berschauer research collection.

Type Locality. 1-2 m depth on the Recife de Arengueira, Abrolhos Platform, off Caravelas, southern Bahia State, Brazil (17° 44′ 45¨ S, 39° 06′ 28¨ W). Found in crevices on limestone platforms.

Distribution. At present, *Coltroconus valianti* is known only from the Recife de Arenguiera coral reef system off Caravelas, southern Bahia State, Brazil.

Etymology. The new species is named for Weslley Valiant de Matos of Alcobaça, Bahia State, Brazil; renowned diver and explorer of the Abrolhos Platform, who has discovered many new endemic species and has contributed greatly to our knowledge of the Bahian molluscan fauna.

Discussion. Of the known *Coltroconus* taxa, the new Abrolhos Platform species is closest to *C. henriquei* Petuch and Myers, 2014 from the adjacent Royal Charlotte Bank (Figure 2G). *Coltroconus valianti* differs from its Royal Charlotte congener in being a narrower and more slender species that it not as broad across the shoulder, in having more numerous and smaller shoulder knobs, in being a more sculptured shell with more numerous and stronger spiral grooves and ribs, and in being a much more colorful shell, having a deep yellow and orange base color instead of the pale cream-white seen on *C. henriquei*. This new species is the seventh known member of the genus *Coltroconus*, a group of tiny, rotund cones that characteristically exhibit large, rounded knobs and spines along their shoulders and spire whorls, resembling tiny *Stephanoconus* species. The entire genus is endemic to the Abrolhos Platform, Royal Charlotte Bank, and seamounts like the adjacent Sulfur Bank and Minerva Seamount.

Genus *Jaspidiconus* Petuch, 2004
(Type species: *Jaspidiconus jaspideus* (Gmelin, 1791))

Jaspidiconus carlagrezziae Petuch, Coltro, and Berschauer, new species
(Figure 2C, D)

Description. Shell of average size for genus, elongated and cylindrical, with slightly convex sides; shoulder sharply angled, bordered with thin, slightly raised carina; spire pyramidal, with sloping sides; body whorl ornamented with 18-20 evenly-spaced shallow spiral grooves and low, raised spiral cords which become stronger and more pronounced on anterior half; base color of body whorl white or pale cream-white overlaid with large amorphous reddish-brown flammules, roughly arranged in 2 wide bands; low raised cords marked with brown dots and dashes, producing speckled appearance; edge of shoulder carina marked with large, prominent, evenly-spaced dark brown dots; early spire whorls white; later spire whorls marked with thin, widely-spaced dark brown flammules; aperture proportionally wide, white within interior; protoconch white, exerted and mamillate, composed of 2 ½ whorls.

Type Material. HOLOTYPE - length 21.3 mm, width 10.2 mm, Recife de Areia, Abrolhos Platform, Brazil, MZSP 152149 (Figure 2C, D); PARATYPE - length 19.4 mm, same locality and depth as the holotype, in the Petuch research collection.

Type Locality. 10-25 m depth on the Recife de Areia, Abrolhos Platform, off Alcobaça, southern Bahia State, Brazil (17° 36′ 47″ S, 39° 04′ 02″ W). Found in coral rubble and carbonate sand.

Distribution. At present, known only from the Recife de Areia coral reef system off Alcobaça, southern Bahia State, Brazil.

Etymology. The new species is named for Carla Grezzi of São Paulo, SP, Brazil; an inspired amateur naturalist and malacologist, who manages the offices of Femorale São Paulo specimen shells.

Discussion. Of the known Bahian *Jaspidiconus* species, *J. carlagrezziae* is most similar, in general shape and color pattern, to *J. josei* Petuch and Berschauer, 2016 (Figure 2I) from farther north along the Brazilian coast near Salvador. The new Abrolhos species differs from its northern congener in being a smaller, narrower, and more slender shell, in having spiral grooves and cords over the entire body whorl, and in being a less colorful shell that lacks the pale lavender and tan base color that is typical of *J. josei*. Of the known Abrolhos Platform *Jaspidiconus* species, *J. carlagrezziae* is most similar to *J. ramosorum* Petuch and Berschauer, 2019 (Figure 3B), but differs in being a more inflated, less slender shell, in having distinct raised cords on the body whorl, and in being a less colorful shell, lacking the blue base color and the large, dark bluish-brown longitudinal flammules on the body whorl. The new species also differs in the form of the color pattern on the shoulder and spire whorls, with *J. ramosorum* lacking the band of small brown dots along the shoulder carina and having, instead, widely-spaced dark brown checkers that correspond to the flammules on the spire whorls.

Subfamily Puncticulinae
Genus *Poremskiconus* Petuch, 2013
(Type species: *Poremskiconus archetypus* (Crosse, 1865))

Poremskiconus uhlei Petuch, Coltro, and Berschauer, new species
(Figure 2E, F)

Description. Shell of average size for genus, stocky, slightly inflated, with low, flattened spire; shoulder sharply-angled, subcarinate, slightly undulating; body whorl smooth and polished, with 8-10 raised cords around anterior one-third; body whorl consistently solid olive-green with thin band of dark brown and white checker-like flammules around mid-body; spire whorls white, overlaid with closely-packed thin dark brown flammules, arranged in radial pattern; earliest spire whorls bright reddish-pink; white spire color and edges of dark brown spire flammules extend onto edge of shoulder, producing distinct white and dark brown checkered pattern; aperture uniformly narrow, with interior of aperture varying in color from pale olive-green to lavender; protoconch very exerted and projecting, mamillate, composed of 2 ½ whorls, bright red in color.

Type Material. HOLOTYPE - length 21.1 mm, width 11.6 mm, SE of Alcobaça, Abrolhos Platform, Brazil, MZSP 152147 (Figure 2E, F); PARATYPES - lengths 18 mm and 22 mm, same locality and depth as the holotype, in the Petuch research collection; length 21.8 mm, same locality and depth as the holotype, in the Berschauer research collection.

Type Locality. 25-35 m depth on the Abrolhos Platform, southeast of Alcobaça, southern Bahia State, Brazil (17° 58′ 57″ S, 38° 28′ 35″ W). Found in coral rubble.

Distribution. At present, known only from coral rubble areas, in 25-35 m depth, off Alcobaça and Praia do Barra, Abrolhos Platform, southern Bahia State, Brazil.

Etymology. Named for Mauricio Sergio Uhle of São Paulo, SP, Brazil, inspired amateur naturalist and malacologist who has aided in the discovery of several new Brazilian mollusks.

Discussion. Of the known Abrolhos Platform *Poremskiconus* species, *P. uhlei* is most similar to *P. pseudocardinalis* (Coltro, 2004) (Figure 2H), both in size and general color pattern. The new species, however, differs from *P. pseudocardinalis* in being a much smoother and less ornamented shell, lacking the strong spiral cords on the body whorl (readily shown here by a comparison of Figures 2E and 2H), in being a broader and more inflated shell, and in having a much lower spire and proportionally wider shoulder. While *P. pseudocardinalis* is highly variable in shell color, most often being red (like Figure 2H), brown, orange, or green, *P. uhlei* is invariant in shell color, being consistently olive-green.

Endemic Cone Shells (Conidae) of the Abrolhos Platform

Unlike other areas of the Brazilian Province and Tropical Western Atlantic Region, the Abrolhos Platform supports only three genera of cone shells. These include the widespread western Atlantic genus *Jaspidiconus*, the southern Caribbean and Brazilian Province restricted genus *Poremskiconus*, and the genus *Coltroconus*, which is completely restricted to the Abrolhos Platform and adjacent seamounts.

The 17 endemic species belonging to these three genera, along with the localities where they have been collected, include:

***Jaspidiconus* Petuch, 2004**
- *J. carlagrezziae* Petuch, Coltro, and Berschauer, 2020 (Recife de Areia)
- *J. keppensi* Petuch and Berschauer, 2018 (off Alcobaça)
- *J. poremskii* Petuch and Myers, 2014 (Corumbau)
- *J. ramosorum* Petuch and Berschauer, 2019 (Recife de Viçosa)

***Poremskiconus* Petuch, 2013**
- *P. abrolhosensis* (Petuch, 1988) (Parcel das Paredes)
- *P. bertarollae* (Costa and Simone, 1997) (Cumuruxatiba)
- *P. cargilei* (Coltro, 2004) (off Alcobaça)
- *P. pseudocardinalis* (Coltro, 2004) (off Alcobaça)
- *P. tonisii* Petuch and Myers, 2014 (Prado)
- *P. uhlei* Petuch, Coltro, and Berschauer, 2020 (off Alcobaça)

***Coltroconus* Petuch, 2013**
- *C. bianchii* Petuch and Berschauer, 2018 (Minerva Seamount)
- *C. bodarti* (Coltro, 2004) (off Alcobaça)
- *C. delucai* (Coltro, 2004) (off Alcobaça)
- *C. henriquei* Petuch and Myers, 2014 (Royal Charlotte Bank)
- *C. iansa* (Petuch, 1979) (Ilha Santa Barbara, Abrolhos Archipelago)
- *C. schirrmeisteri* (Coltro, 2004) (Sulfur Bank)
- *C. valianti* Petuch, Coltro, and Berschauer, 2020 (Recife de Arengueira)

These endemic Abrolhos cone shells are illustrated here on Figures 2 and 3. This is the largest cone fauna found in any single area of Brazil and is also the largest endemic cone fauna found within the entire Brazilian Molluscan Province. Another cluster of *Jaspidiconus* is also known to exist in Todos os Santos Bay, Itaparica Island, and Salvador area of Bahia State, north of the Abrolhos Platform. This swarm of at least nine sibling species, many with very small, limited distributions, was discussed by Petuch and Berschauer, 2018, 2019 and by Petuch and Myers, 2014. Along northern Brazil, in the Cearaian Subprovince (see Petuch, 2013), a species radiation of *Poremskiconus* is also known to exist, with at least seven species being endemic to that subprovincial area. These discoveries have shown that the Brazilian Province conid fauna is far richer than was previously thought. Further explorations on the multitude of coral reefs and coralline algal bioherms on the Abrolhos Platform and isolated seamounts will doubtlessly yield many more new and unnamed cones.

ACKNOWLEDGMENTS

The authors thank the following for their generous donation of Abrolhos study specimens and for sharing their information about the ecology and distribution of the Abrolhos cone shells: Damaso Monteiro (Fortaleza, Brazil and Oporto, Portugal); Wessley Valiant de Matos (Alcobaça, Brazil); Marcus Coltro (São Paulo, Brazil); Dr. Zelinda Leão and Irton Leão (Salvador, Brazil); Olivier Crabos (Salvador, Brazil); Andre Poremski (Washington, D.C. USA); and Mauricio Sergio Uhle (São Paulo, Brazil).

LITERATURE CITED

Coltro, J., Jr. 2004. New species of Conidae from Northeastern Brazil (Mollusca: Gastropoda). Strombus 11:1-15.

Leão, Z.M., R. Kikuchi, and V. Testa. 2003. Corals and Coral Reefs of Brazil. in Latin American Coral Reefs. Elsevier Science, Amsterdam, Netherlands. pp. 9-52.

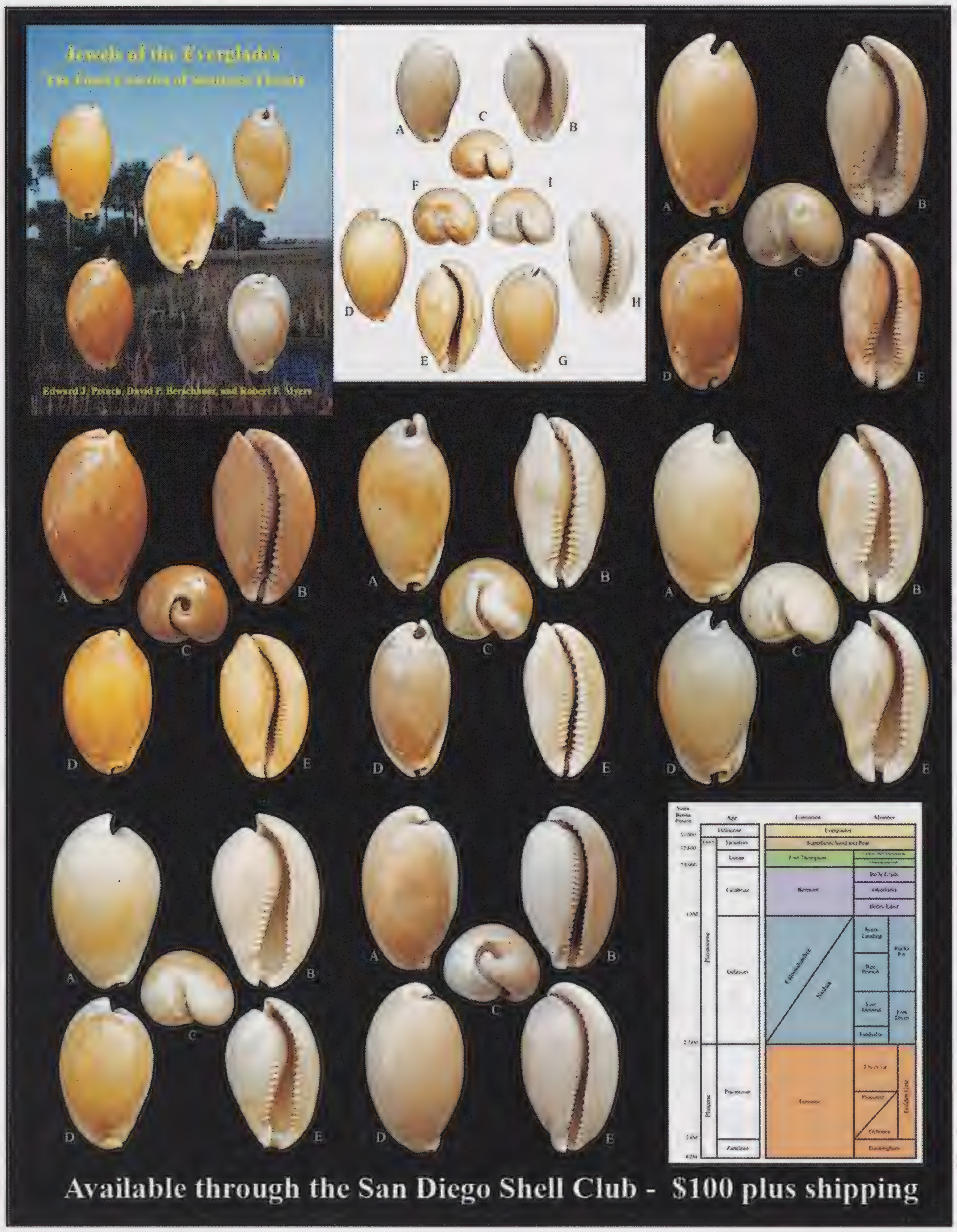
Petuch, E.J. 1979. New Gastropods from the Abrolhos Archipelago and Reef Complex. Proceedings of the Biological Society of Washington 92(3):510-526.

Petuch, E.J. 2013. Biogeography and Biodiversity of Western Atlantic Mollusks. CRC Press, Boca Raton, New York, London. 234 pp.

Petuch, E.J. and D.P. Berschauer. 2018. Ten New Cone Shells form Indonesia, the Marquesas Islands, Brazil, and Pacific Panama. The Festivus 50(1):17- 32.

Petuch, E.J. and D.P. Berschauer. 2019. New Species of Mollusks (Gastropoda and Bivalvia) from the Tropical Western Atlantic, West Africa, and Red Sea. The Festivus 51(3):218-230.

Petuch, E.J. and R. Myers. 2014. New Species of Conidae and Conilithidae (Gastropoda: Conoidea) from the Bahamas, eastern Caribbean, and Brazil. Xenophora Taxonomy 3:26-46. (April, 2014).


Jewels of the Everglades
Edward J. Petuch, David P. Berschauer, and Robert F. Myers
A C B F I D H E G
A B C D E
A B C D E
A B C D E
A B C D E
A B C D E
A B C D E
Available through the San Diego Shell Club - $100 plus shipping

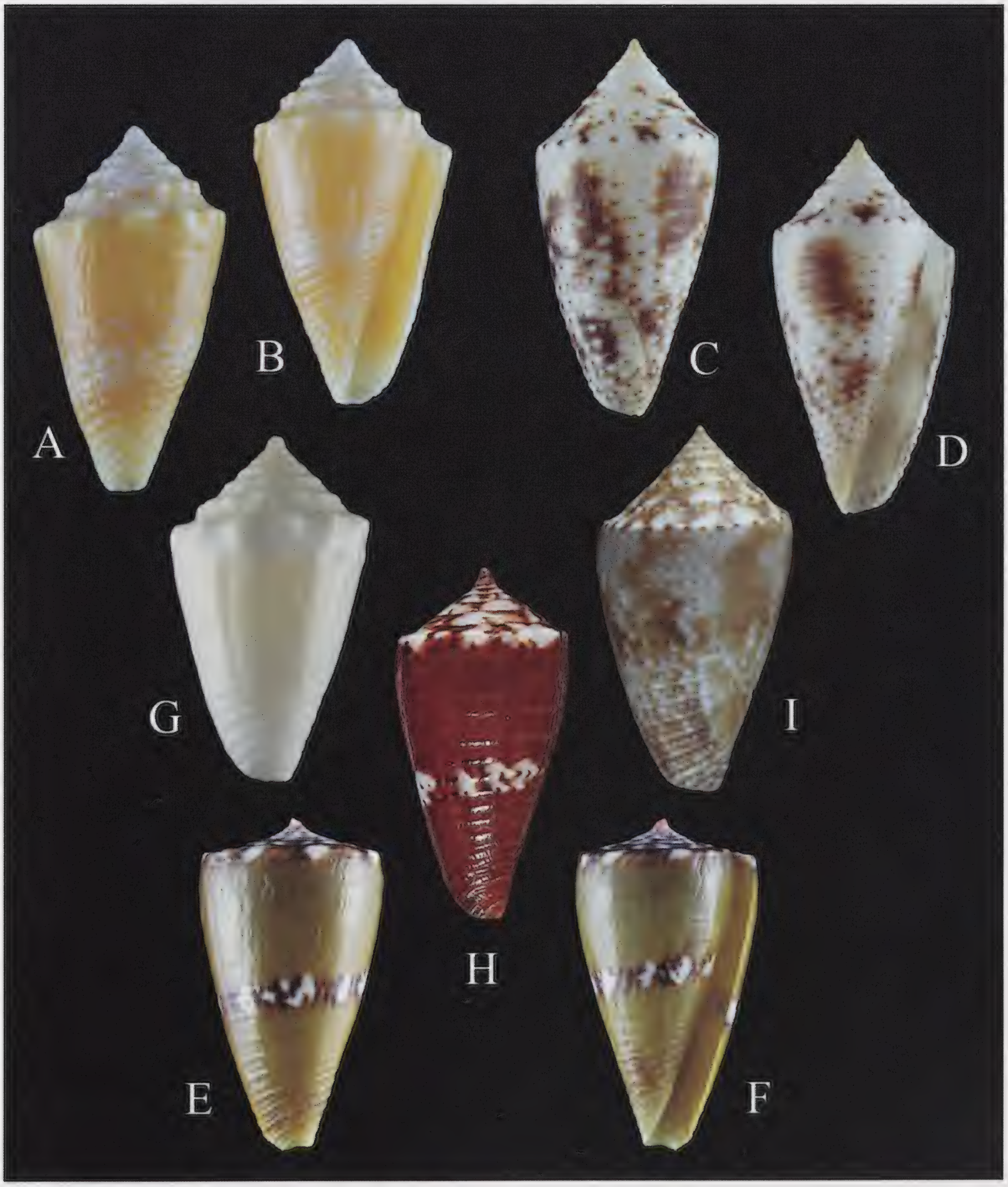


Figure 2. New Cone Shells from the Abrolhos Platform, Brazil.
A, B= *Coltroconus valianti* Petuch, Coltro, and Berschauer, new species, holotype, length 12.4 mm, Recife de Arengueira, Abrolhos Platform, Bahia State, Brazil; **C, D=** *Jaspidiconus carlagrezziae* Petuch, Coltro, and Berschauer, new species, holotype, length 21.3 mm, Recife de Areia, Abrolhos Platform, Bahia State, Brazil; **E, F=** *Poremskiconus uhlei* Petuch, Coltro, and Berschauer, new species, holotype, length 21.1 mm, SE of Alcobaça, Abrolhos Platform, Bahia State, Brazil; **G=** *Coltroconus henriquei* Petuch and Myers, 2014, holotype, length 10 mm, Royal Charlotte Bank, Abrolhos Platform, Bahia State, Brazil (for comparison with *Coltroconus valianti*); **H=** *Poremskiconus pseudocardinalis* (Coltro, 2004), length 17.7 mm, Abrolhos Platform, Bahia State, Brazil (for comparison with *Poremskiconus uhlei*); **I=** *Jaspidiconus josei* Petuch and Berschauer, 2016, length 21 mm, Praia de Guarajuba, Bahia State, Brazil (for comparison with *Jaspidiconus carlagressiae*).

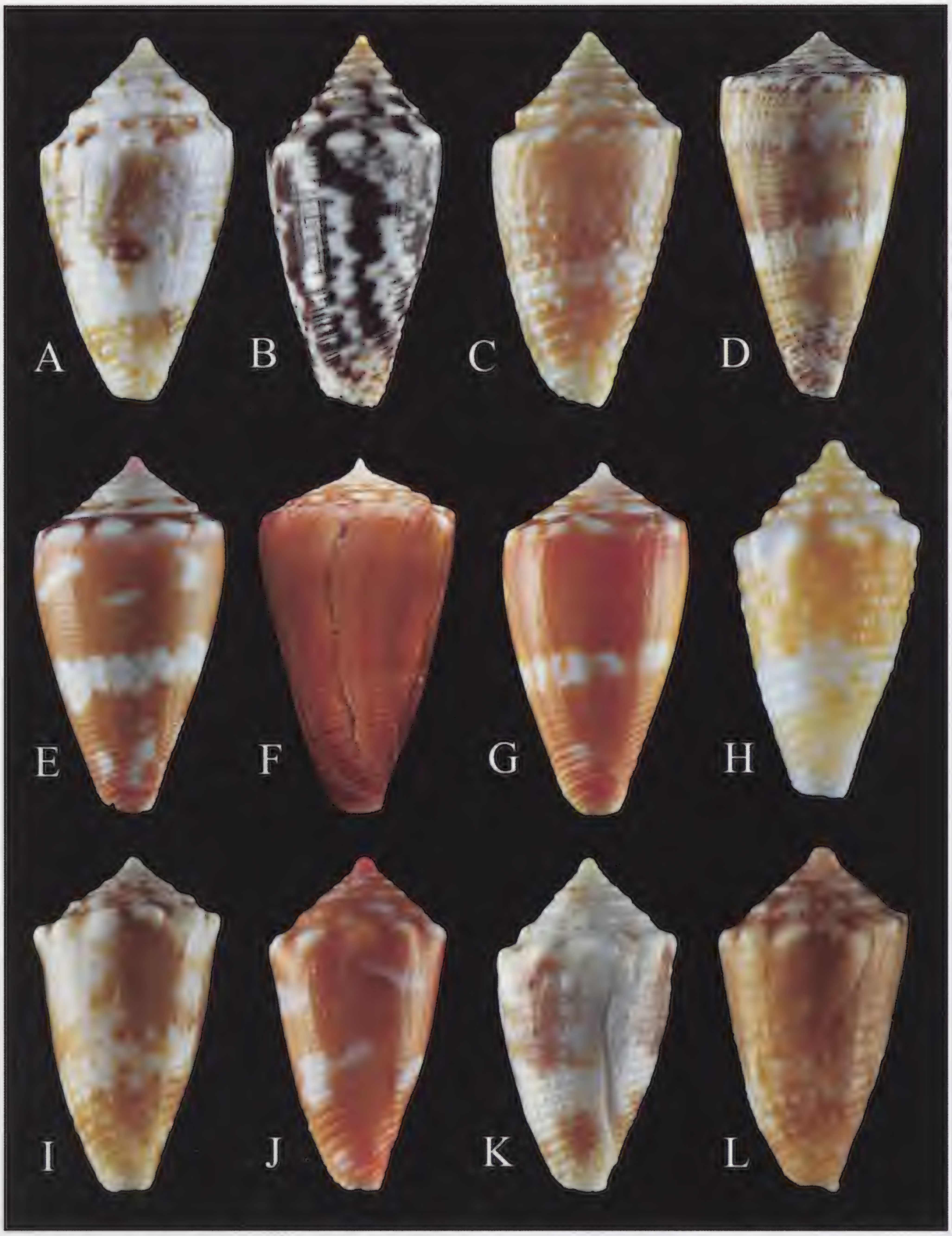


Figure 3. Endemic Cone Shells of the Abrolhos Platform.
A= *Jaspidiconus keppensi* Petuch and Berschauer, 2018, length 10 mm, reefs off Alcobaça (may belong in the genus *Coltroconus*); **B=** *Jaspidiconus ramosorum* Petuch and Berschauer, 2019, length 22 mm, Viçosa Reef, off Nova Viçosa; **C=** *Jaspidiconus poremskii* Petuch and Myers, 2014, length 12 mm, reefs off Corumbau; **D=** *Poremskiconus cargilei* (Coltro, 2004), length 28 mm, Coroa Vermelha Reefs; **E=** *Poremskiconus abrolhosensis* (Petuch, 1988). length 22 mm, Parcel das Paredes Reefs; **F=** *Poremskiconus tonisii* Petuch and Myers, 2014, length 26 mm, Prado Reefs; **G=** *Poremskiconus bertarollae* (Costa and Simone, 1997), length 23 mm, off Cumuruxatiba; **H=** *Coltroconus bianchii* Petuch and Berschauer, 2018, length 8 mm, Minerva Seamount; **I=** *Coltroconus bodarti* (Coltro, 2004), length 13 mm, off Santa Barbara Island, Abrolhos Archipelago; **J=** *Coltroconus delucai* (Coltro, 2004), length 11mm, Parcel das Paredes Reefs; **K=** *Coltroconus iansa* (Petuch, 1979), length 14 mm, Ilha Santa Barbara, Abrolhos Archipelago; **L=** *Coltroconus schirrmeisteri* (Coltro, 2004), length 8 mm, Sulfur Bank.

ISSN 0738-9388

Two unusual keyhole limpets (Mollusca: Gastropoda: Fissurellidae) from southern California

Charles L. Powell, II [1] and Cheryl D. Millard [2]
[1] U.S. Geological Survey, Menlo Park, California 94025; powell2@sbcglobal.net
[2] 4024 North West Country Lane, Bremerton, Washington 98312; dyes.inlet.limpet@gmail.com

ABSTRACT Two small keyhole limpets (Mollusca: Gastropoda: Fissurellidae) were collected live by the senior author and his father (Charles Powell) in the winters of 1967 and 1968 from the side/bottom of moderately flat rocks in the low intertidal zone at Doheny Beach State Park, Dana Point, Orange County, southern California. The larger specimen was collected in the winter of 1968 and the small specimen was collected in winter of 1967. These specimens resemble the genus *Lucapinella* yet do not quite match any of the known species. The shells are also somewhat similar to *Dendrofissurella scutellum* from South Africa and two species of *Amblychilepas* from Australia, however neither of the Dohney Beach specimens can be attributed to those species. This possible new species is assigned to the genus *Lucapinella* and remains unnamed until additional specimens can be located to determine if they are a new species, a rare exotic species, or a very unusual, miniature *L. callomarginata*.

KEYWORDS Mollusca, Fissurellidae, keyhole limpet, intertidal zone, southern California

INTRODUCTION

Two small fissurellid limpets attributed to the genus *Lucapinella* were collected by the lead author and his father, Charles Powell (deceased), one each during the winter months of 1967 and 1968 from Dohney Beach State Park, Orange County, California. These two specimens are different from any known eastern Pacific *Lucapinella*, and are described and illustrated here.

Measurements:

Measurements are defined as follows: **height**= the greatest distance between the dorsal and ventral termini; **length**= the greatest distance between the anterior and posterior termini; **width**= the greatest distance between the dorsal and ventral surfaces.

Abbreviations:

Institution abbreviations include **CAS IZ**= Invertebrate Zoology section, California Academy of Sciences, Golden Gate Park, San Francisco, CA; **LACM**= Malacology Department, Natural History Museum of Los Angeles County, Los Angeles, CA; **USGS**= U.S. Geological Survey, Menlo Park, CA campus; **TBD**= to be determined (type numbers could not be obtained due to the current pandemic).

SPECIMEN DESCRIPTIONS

The larger specimen (Figures 1 A-C) appears somewhat worn and is about 16.7 mm long, 9.3 mm wide, and 4.2 mm high. The color is split into four parts as if there is an X centered on the apical orifice. Coloration of the top and bottom quadrants is reddish and the side quadrants are off-white to gray and somewhat blotchy. The apical orifice is a bit less than 1/6th the shell length and located dorsally about the center of the shell, is generally broadly over, although the larger specimen appears to have been injured and the left side of the orifice is almost pointed. The sculpturing consists of major scabbarded ribs with a smaller secondary scabbarded rib mid-way between the major ribs and tertiary scabbard ribs between the major and secondary ribs with riblets on either side. The interior of the shell shows smooth margins, a trait unusual in *Lucapinella*. On the ventral side and interior of the shell margins is a muscle scar, which is rounded at the bottom and slightly pinched about the apical orifice. The scar then widens before inclining to a broadly rounded point at the top. Around the apical orifice is a broad scar about the same shape as the apical orifice but not thickened to any extent, as seen in most *Lucapinella*.

The smaller specimen (Figures 1D-F) also appears worn and is about 14.6 mm long, 8.2 mm wide, and 3.5 mm high. The coloration is different in this specimen with reddish rays extending out from the center of the shell at angles centered around approximately 20°, 160°, 200° and 320°, or approximately 20° from center on the anterior end and approximately 20° from center on the posterior end. Around the apical orifice is an irregular white area with rounded lobes. Between the rays the color is blotchy light brown to cream. Sculpturing is the same as on the larger specimen. The upper right of the shell is presumed to have been injured with a shelf of whitish shell beyond the normal shell margin. The apical orifice is broadly rounded at the top and is widest approximately at its center. The interior of the shell shows smooth margins (unusual in *Lucapinella*) and the healed damage along the upper right margin resulted in a rounded indentation. Interior of the shell margins is a muscle scar rounded at the bottom and slightly pinched about the apical orifice, and then broadening and inclined to irregular points. Around the apical orifice is a broad scar about the same shape as the apical orifice but not thickened to any extent as in most *Lucapinella*.

DISCUSSION

Members of the family Fissurellidae from California are divided into 11 genera: *Cranopsis, Cornisepta, Diodora, Emarginula, Fissurella, Fissurellidae, Lucapinella, Megathura, Puncturella, Rimula,* and *Scelidonta*. Of these, the Doheny Beach State Park specimens most closely match the genus *Lucapinella* and they are assigned to that genus. The assignment is somewhat questionable because in profile the anterior and posterior ends bend up significantly and this is not a feature seen in other *Lucapinella*. Other Fissurellidae genera from California are easily separated from these specimens in shell form alone. However the South African species *Dendrofissurella scutellum* (Gmelin, 1791) and *Amblychilepas platyactis* McLean and Kilburn (1986), and the Australian species *Amblychilepas nigrata* (Sowerby, I, 1835) have similar shells that have their anterior and posterior margins bend away from the substrate as do the Doheny Beach specimens.

These specimens compare favorably with the northeastern Pacific genus *Lucapinella* but are easily distinguished from all known species in that genus. In addition, they compare favorably with the South African fissurellids *Dendrofissurella scutellum* and *Amblychilepas platyactis* McLean and Kilburn (1986), and the Australian fissurellid *Amblychilepas nigrita* but can also be distinguished from those species in the shape of the shell.

In the eastern Pacific the genus *Lucapinella* is composed of five species including *L. aequalis*

(Sowerby, 1834), *L. callomarginata*, *L. crenifera* (Sowerby, 1835), *L. eleanorae* McLean (1967), and *L. milleri* Berry (1959) (Keen, 1971). The only southern California species of *Lucapinella*, *L. callomarginata,* found from Morro Bay, Monterey County, central California south to Bahia Magdalena, Baja California Sur, México from the low intertidal to 20 m (LACM collections), differs by its larger size, differently shaped apical orifice, fluting on the interior of the shells outer margin, coloration, and sculpture. Additionally, *L. callomarginata* has a profile which is relatively straight to and from the apical orifice, while the Doheny Beach specimens the profiles are slightly concave.

Lucapinella aequalis that occurs from Puerto Guatulco, Oxaca, México, south to Punta Santa Elena, Santa Elena Province, Ecuador (Keen, 1971) can be distinguished from the Doheny Beach specimens by its parallel sides raised and narrow callus on the inside of the apical orifice. The Doheny Beach specimens appear very similar to *L. crenifera*. *Lucapinella crenifera* lives considerably further south occurring from Salinas, Ecuador, south to Bahía Independencia, Pisco Province, Peru and the Islas Galápagos. It can be separated from the Doheny Beach specimens by its narrow apical orifice, coloration, and the number and shape of secondary radial riblets. The smaller and differently colored *L. eleanorae* McLean (1967) found from Guaymas, Sonora, México south to Punta Santa Elena, Santa Elena Province, Ecuador (McLean, 1967) can be distinguished by its coarser sculpture and small oval apical orifice. Lastly, *L. milleri* Berry (1959), which occurs throughout the Gulfo de California, south to Archipelago de las Perlas, Panama Bay, Panama (Keen, 1971) is easily distinguished by its small size with a relatively large apical orifice and details of its sculpture.

Four other species living in South Africa, Australia, and the eastern United States, *Amblychilepas nigrita*, *A. platyactis* McLean and Kilburn (1986), *Dendrofissurella scutella*, and *Lucapinella limatula* (Reeve, 1850), have shells similar to the Dohney Beach specimens. Some specimens of the western Atlantic species *L. limatula* are remarkably similar to the *Lucapinella* in question. However, they can be distinguished by their apical orifice that is typically pinched in at its top as well as the side profile of the shell that does not show an elevated anterior and posterior end as our specimens do. The South African species *D. scutella* is also similar but can be easily distinguished by its parallel sides and by the shape of the apical orifice. The Australian species *A. nigrita* is also similar but can be distinguished by its straight sides and different shaped apical orifice, which is larger in proportion to the length of its shell. Similarly, the South African species *A. platyactis* McLean and Kilburn (1986) can be distinguished by its differently shaped apical orifice.

Although they were collected live the soft tissue was not retained and additional specimens have not been found in the following 50 years. Because this study is limited to only two shells collected over 50 years ago and no soft tissue was preserved they are not described as new. It is preferred that additional specimens be collected with soft tissue for genetic analysis to ensure these are not simple aberrant specimens of *Lucapinella callomarginata* (Dall, 1871) or an exotic taxon transported to the area by a boat (which seems highly unlikely) as no species matching these two specimens are known worldwide.

ACKNOWLEDGEMENTS

We thank Lindsey T. Groves (LACM) for the photographs of *Lucapinella eleanorae* used for comparison with our specimens and his helpful review of the manuscript. Elizabeth Kools (CAS IZ) is thanked for allowing the senior author to examine specimens in her care. We also thank the reviewers Lindsey T. Groves (LACM), Mary McGann (U.S. Geological Survey), and an anonymous reviewer.

LITERATURE CITED

Berry, S.S., 1959. Notes of new eastern Pacific Mollusca—III. Leaflets in Malacology, v. 1, no. 18, p. 108-113.

Dall, W.H., 1871. On some new or interesting west American shells obtained from the dredgings of the U.S. Fish Commission steamer Albatross in 1888, and from other sources. U.S. National Museum Proceedings, v. 14, no. 849, p. 173-191.

Gmelin, J.F., 1791. Caroli a Linné Systema naturae per regna tria naturae. Editio decima tertia. Leipzig, v. 1, pt. 6, Vermes, p. 3021-2910.

Keen, A.M., 1971. Sea shells of Tropical West America: Marine Mollusks from Baja California to Peru (second edition). Stanford. Stanford University Press, 1064 p.

McLean, J.H., 1967. West American species of *Lucapinella*. The Veliger, v. 9, no. 3, p. 349-352.

McLean J.H. and R.N. Kilburn. 1986. Propodial elaboration in Southern African and Indian Ocean Fissurellidae (Mollusca: Prosobranchia) with descriptions of two new genera and one new species. Contributions in Science, Natural History Museum of Los Angeles County 379:1-12.

Reeve L.A. 1849-1850. Monograph of the genus *Fissurella*. In Conchologia Iconica, v. 6, pl. 1-16 and unpaginated text. L. Reeve & Co., London, available online at https://www.biodiversitylibrary.org/page/9142046.

Sowerby, G.B., I. 1834-1845. Characters of new genera and species of Mollusca and Conchifera, collected by Mr. Cuming. Proceedings of the Zoological Society of London, for 1834:6-8 (14 May 1834), 17-19, 21-22 (17 June 1834), 44-47 (6 September 1834), 68-72 (25 November 1834), 87-89 (25 October 1834), 123-128 (20 March 1835).

Sowerby, G.B., I. 1835. Characters of and observations on new genera and species of Mollusca and Conchifera collected by Mr. Cuming. Zoological Society of London Proceedings, for 1834, p. 4-7 (April 3), p. 21-23 (April 16), p. 41-47 (June 1), p. 49-51 (July 17), p. 84-85, 93-96 (September 25), 109-110 (October 9).

<ins>Authors' note</ins>: If anyone has additional specimens of this potentially new species in their collections we would like to examine them.

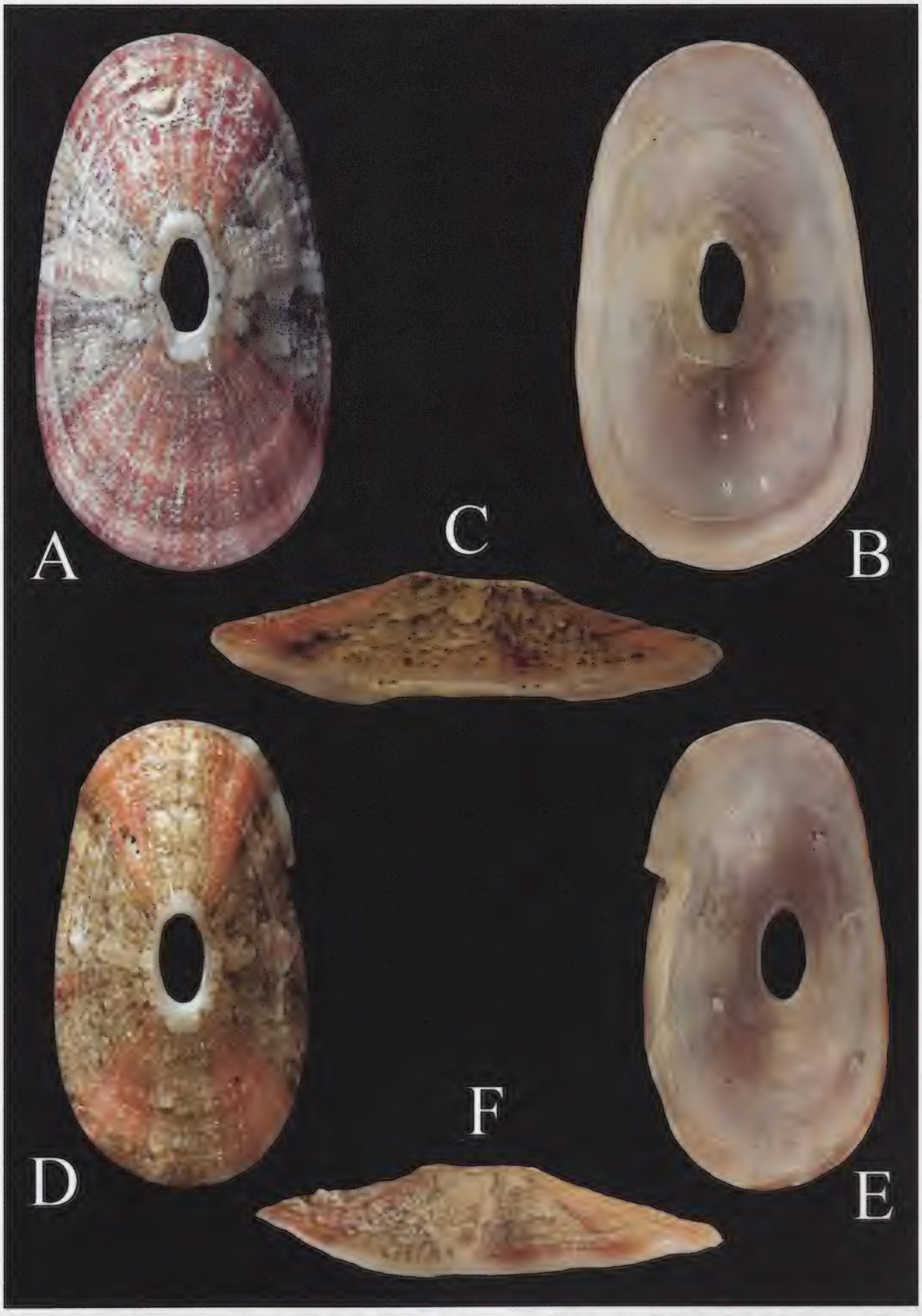


Figure 1. ***Lucapinella*** **species indeterminate.** Collected from the low intertidal zone at Doheny Beach State Park, Dana Point, Orange County, southern California. **A, B, C=** 16.7 mm long, 9.3 mm wide, 4.2 mm high (A. Dorsal view, B. Ventral view, C. Side view); **D, E, F=** 14.6 mm long, 8.2 mm wide, 3.5 mm high (D. Dorsal view, E. Ventral view, F. Side view). These specimens will be deposited with the Invertebrate Zoology section of the California Academy of Sciences when employees of the Academy can return to work after the current pandemic.

ISSN 0738-9388

A new subspecies of *Papuina antiqua* (Adams & Reeve, 1850) from Yapen Island, Papua, Indonesia

Jeff Parsons [1] and John Abbas [2]
[1] 47 Elizabeth Street, Aitkenvale, Queensland, Australia 4814
jeffonese@yahoo.com.au
[2] Lihue, Kauai, Hawaii — Jalan Demaga Baru, Muara Angke, Jakarta Utara Pos 14450,
Jakarta, Indonesia john123abba@yahoo.com

ABSTRACT This paper describes a new subspecies of *Papuina antiqua* (Adams & Reeve, 1850) from forested hills east of Serui on the south coast of Yapen Island in Papua Province, Indonesia. The pink coloration of the early whorls and minor differences in sculpture separates it from *Papuina antiqua* and its other named subspecies and form.

KEY WORDS *Papuina antiqua*, *Papuina antiqua rosasumma*, Yapen Island, Papua, Indonesia

INTRODUCTION

In 2007, the junior author went to Serui (Seroei) on the southern coast of Yapen Island and found no snails west or north of the town. Travelling to the end of the road about 15 to 20 km east of Serui, the junior author found snails on the forested hills north of Kainut village. Among them was a white shell of the genus *Papuina* von Martens, 1860 with a pink top and no more located until the end of September 2019, when a local found more specimens while collecting snails for the authors. The new specimens all have the pink top and after a short study period, they have been determined to be a new subspecies of *Papuina antiqua* (Adams & Reeve, 1850) restricted to the Angkaisera District on Yapen Island.

Materials and Methods.

Shells were measured using digital Vernier callipers (0.01 mm resolution), sculpture examined under low magnification (10x) using a jeweller's loupe, and weighed using a pocket-sized electronic scale (capacity 300 g x 0.01 g). Whorl count includes the apex and counted precise to 0.125 (⅛) whorl. 'Paries' (adj. parietal) refers to the 'inner apertural wall' and 'palatum' (adj. palatal) refers to the 'outer apertural wall'. Relative shell sizes (height) for the genus *Papuina* mentioned are as follows: small < 20 mm, medium 20-35 mm and large > 35 mm.

Four shells make up the type series. All but one of the shells examined had formed an outer lip: adults have a thickened and rimmed lip (paratype 3 had its protoconch squashed during early development), one subadult (paratype 1) with a rough thin lip and one juvenile without a lip (paratype 2). Photo and image credits appear below each image. The holotype description was determined from the shell morphology of dry empty shells obtained by the junior author. Comparative material comprised of shells from the private collections of the authors, images of type shells from the literature and images of museum types or specimen shells.

Abbreviations used for museums and private collections:

ANSP:	The Academy of Natural Sciences of Drexel University, Philadelphia, United States of America
NHMUK:	Natural History Museum, London, England, United Kingdom
ZMB:	specimen label code at Museum für Naturkunde, Berlin, Germany; previously known as Zoologisches Museum Berlin
JA:	John Abbas collection
JP:	Jeff Parsons collection

Abbreviations for shell morphometry, shell coiling and other:

D:	shell width (abbreviation for 'diameter' as per literature usage)
H:	shell height
H/D:	shell height/shell width ratio
N:	whorl count
W:	shell weight
JA	data, observations, comments, photos or other by John Abbas
JP	data, observations, comments, photos or other by Jeff Parsons

Taxonomic remarks.

P. antiqua complex according to van Benthem Jutting (1965):

P. antiqua (Adams & Reeve, 1850)
  Syn. *P. antiqua leonardi* (Tapperone Canefri, 1886)
  Syn. *P. antiqua horderi* (Sowberby III, 1889)
P. antiqua var. *xanthosoma* (Pilsbry, 1891)

Although van Benthem Jutting (1965) studied and selected a lectotype from the types of *P. antiqua leonardi*, and studied the holotypes of *P. antiqua* and *P. antiqua horderi*, she did not record their museum catalogue/registration numbers. This has made it difficult to track down all of those types and have them photographed. Until we have studied all types, we here accept *P. antiqua leonardi* and *P. antiqua horderi* as valid subspecies, and maintain *P. antiqua* var. *xanthosoma* as a varietal name until confirmed otherwise.

SYSTEMATICS

Family: Camaenidae Pilsbry, 1895
Subfamily: Hadrinae Iredale, 1937
Genus *Papuina* (f.) von Martens, 1860
Type species: *Helix lituus* Lesson, 1831

Papuina antiqua rosasumma Parsons and Abbas, new subspecies

(Figures 1-2 and Plate 1, Figures 3-5 and 9-10)

Description. (Holotype) Medium-sized conical shell, semi-obtect umbilicate, solid and translucent. Spire high conical; apex subacute, exsert (protruding). Surface shiny, covered with wrinkled spiral striatulations overlain by close-set growth lines and threads; spirals coarser on the protoconch, forming granules on oblique elements; growth threads on last whorl coarser adsuturally behind the lip, subplicatulate. Shell denuded of periostracum.

Whorls 5.25, regularly increasing and hardly descending in front; upper surface flattened on lower whorls, convex apically; base convex, contracted behind the lip to form a slight bulge near the umbilicus. Periphery subangular on spire whorls with a crenulated filiform carina (carinula) becoming obsolete on the penult, and rounded on the last whorl. Suture deep, impressed below the periphery on teleoconch whorls above the penult. Protoconch rose coloured, fading away as an infrasutural band on the second whorl. Teleoconch pale grey becoming albous (dull white) on lower whorls.

Aperture lunate-oval, wide, oblique, margins convergent and faintly effuse laterally, not forming a papuinoid notch at the periphery. Palatum white and parietal callus only a colourless film. Parieto-labral tubercle is a c. 1 mm, round lump on the ascending lip terminus. Outer lip off-white, thickened and expanded throughout, its edge reflexed to form a rim; upper margin declivous and arched terminally; rounded peripherally and basally. Columella off-white, incrassate, erect and a tooth-like nodule near its base. Columellar margin broadly dilated, partially concealing a narrowly compressed umbilicus.

Type Material. Four shells from the type locality (2 adults, 1 subadult and 1 juvenile). Holotype (white, NHMUK 20200003, Figure 1) H 32.67 mm, D 25.82 mm, H/D 1.27, N 5.25 & W 1.40 g. Paratype 1 (yellow subadult, NHMUK 20200004/1, Plate 1, Figure 3); Paratype 2 (white juvenile, NHMUK 20200004/2, Plate 1, Figure 4); Paratype 3 (white adult, JP, Plate 1, Figure 5).

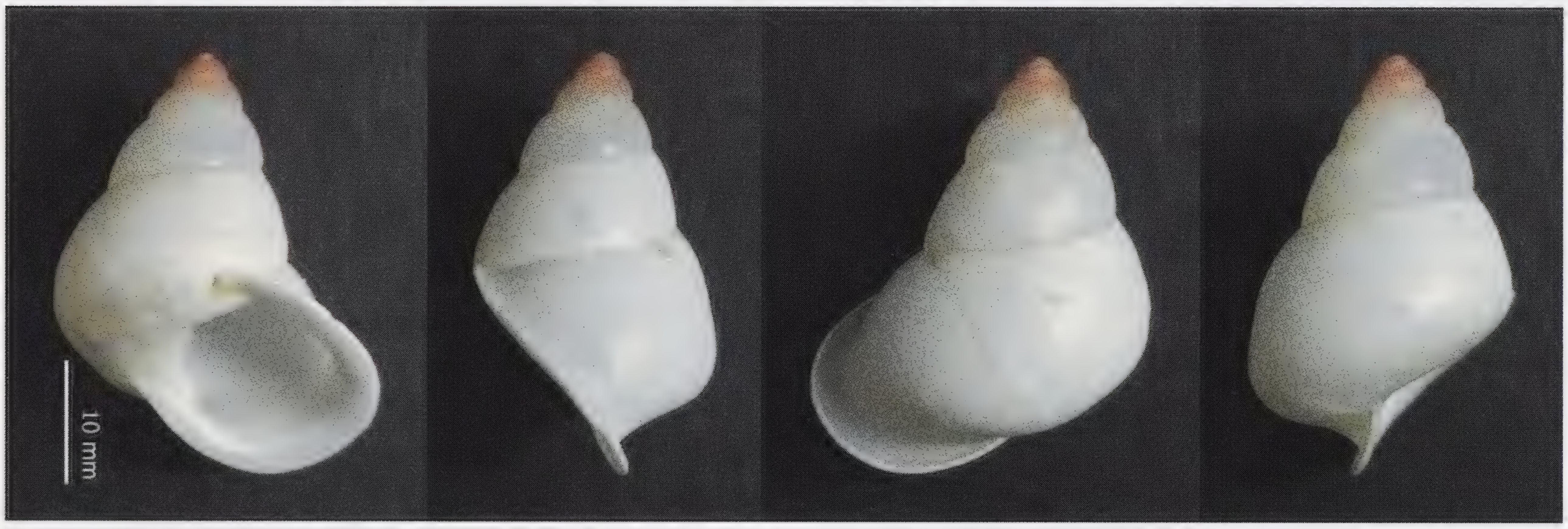


Figure 1. Holotype of *Papuina antiqua rosasumma* n. ssp. NHMUK 20200003 [Photos by JP]

Other Material. Two adult shells from the type locality (JP, Plate 1, Figures 9 and 10)

Measurements. (Five shells, juvenile excluded) H 32.67-37.12 (av. 34.40) mm, D 25.82-31.47 (av. 27.88) mm, H/D 1.18-1.30 (av. 1.24), N 5.0-5.5 (av. 5.275) & W 1.15-2.16 (av. 1.644) g

Type locality. Forested hills behind Kainut village, Angkaisera District, on the south coast of Yapen Island, NE Cenderawasih (Geelvink) Bay in Papua Province, Indonesia.

Distribution. Currently known only from the type location.

Ecology/Habitat. Found on trees in vine forest.

External features of animal. Body blackish purple, foot whitish and tail creamy; whole surface granulated, but not colour differentiated. The optic and sensory tentacles blackish purple with creamy tips, eyes paler. Mantle, its collar and lappets, and pedal (or median longitudinal) groove are not visible in the image (Figure 2); and sole not observed.

Soft parts. Not available for study.

Etymology. The name *rosasumma* (f.) refers to the pink or rosy top of the shell, Latin *rosa-* (f.) "rose-coloured, rosy" + Latin *summa* (f.) (adj., nom. sing.) "summit, topmost, at the top".

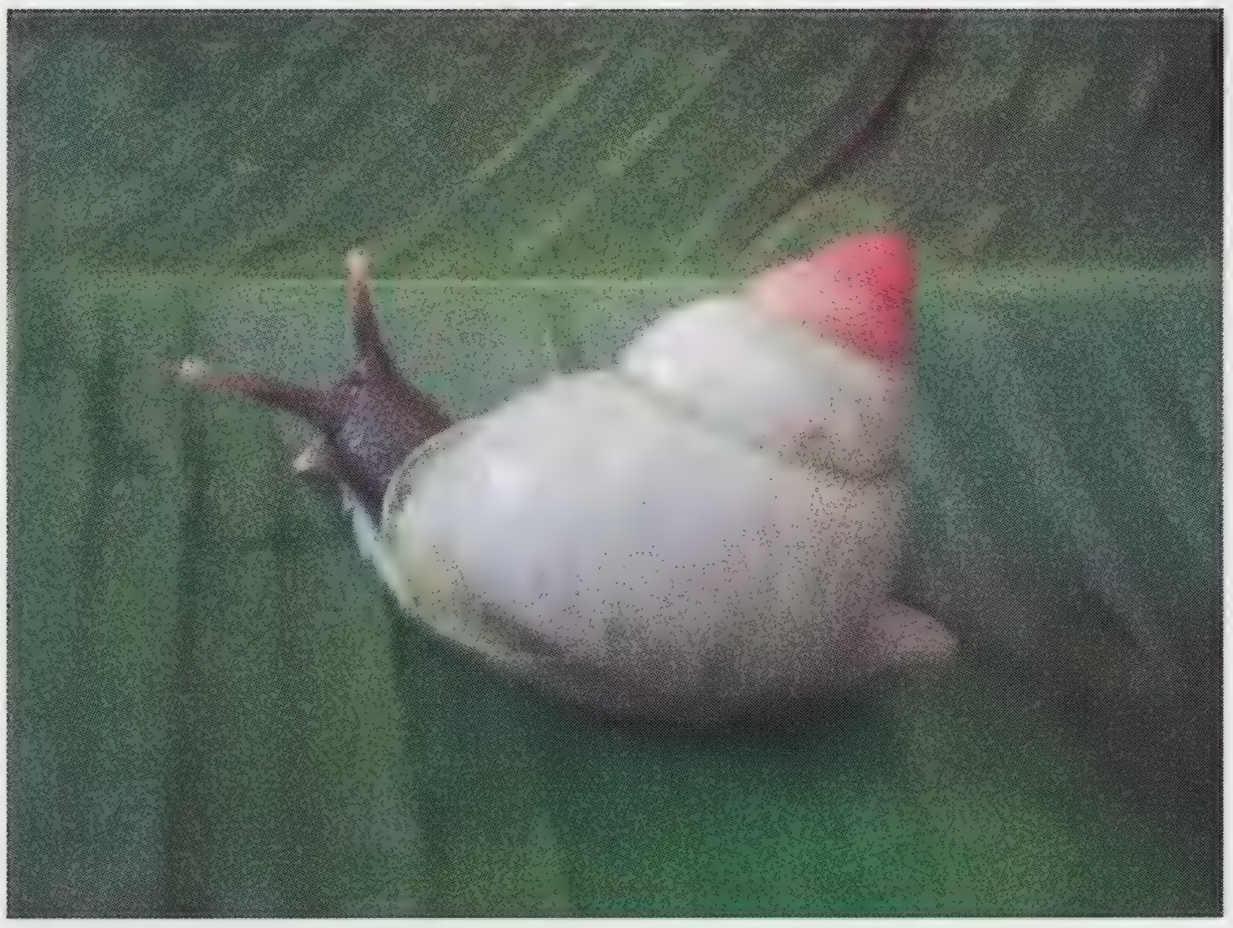


Figure 2. Live *Papuina antiqua rosasumma* n. ssp. [Photo by JA]

Shell Variation. All shells lack a pattern and denuded of their periostracum. The subadult (Plate 1, Figure 3) and juvenile (Plate 1, Figure 4) shells lack the columellar “tooth or lobe” present in the adult shells, which varies from small to medium in size. Shell shape varies from conical with a flattened upper surface (Figure 1, and Plate 1, Figure 3) to turbinate with rounded whorls (Plate 1, Figure 10). The semi-obtect umbilicus is narrowly compressed, open or closed. Surface sculpture as per holotype, finer on whole shell or slightly coarser on protoconch. The lateral profile of the aperture is flat or slightly concave without forming a papuinoid notch at the periphery, *i.e.* outer lip faintly effuse or not. Parieto-labral tubercle present or absent. Outer lip margin rounded throughout or upper margin declivous. Shells are medium to large in size. Upper surface of all whorls convex or flattened on lower whorls. Filiform carina on early whorls visible above the suture or not. Base convex, contracted behind the lip to form a slight bulge near the umbilicus.

Ground colour of the teleoconch is pale grey becoming albous (dull white) on later whorls, or pale lemon yellow (Plate 1, Figure 3). For albous shells: A) all early whorls are rose coloured (Figure 2), B) protoconch is rose coloured (Figure 1, and Plate 1, Figures 4 and 5) or purplish rose (Plate 1, Figure 9), or C) protoconch is white with a rosy infrasutural band (Plate 1, Figure 10). The yellow shell (Plate 1, Figure 3) has a pale orange protoconch with a pink infrasutural band. The squashed protoconch of paratype 3 occurred during early development of the shell. Parietal coloration is pale buff, distinctly coloured (Plate 1, Figure 5) or only tinted (Plate 1, Figures 4 and 10), or coloured as per the penult. Interior or palatal coloration of albous shells is white and cream in the yellow shell. Outer lip of adult shells is white and pallid grey in the subadult shell.

DISCUSSION

Shell size and shape variation for *P. antiqua rosasumma* n. sp. falls within the range of variation seen in, and recorded for, the other members of the *P. antiqua* complex and all have a variable columellar tooth. *Papuina a. rosasumma* n. ssp. differs from all other members of the *P. antiqua* complex by the rose-coloured early whorls, a filiform carina on early whorls and a slight bulge that is more pronounced in the base near the umbilicus.

The holotype of *P. antiqua* (Plate 1, Figure 11; Cuming Collection, NHMUK) has a dead white (greyish white) finely sculptured shell that differs in having a rather obtuse apex and an inflated last whorl. It is described as having an effusely reflected outer lip, whereas in *P. a. rosasumma* n. ssp. it is faintly effuse or not. The type locality of Unsang, Borneo (Sabah) is far out of the expected range for Papuinids and probably a case where traders released the snail at this location. Shells found on Yapen and Muswar (Misowaar) Islands are considered as being *P. antiqua*, have the following differences.

Shells from Yapen Id. collected in the 19th century often appear in museum collections identified originally as '*leonardi*' and then corrected to '*antiqua*'. They are usually unicoloured albous or off white (Plate 1, Figure 16) and others are dual-coloured, as are recently collected shells, which are a bone-coloured shell with a cream coloured protoconch (Plate 1, Figure 8). A recently collected faded cream coloured shell has a primrose yellow protoconch (Plate 1, Figure 7). Shells from Muswar Id. are quite variable in colour: uniform white (Plate 1, Figure 15), light brown, fawn or pale yellow (Fulton, 1910a, 1910b). Parietal coloration is the same as the penult or pale buff tinted (Plate 1, Figure 15) and the palatum is off white, even in the faded yellow shell (Plate 1, Figure 7). Shells studied have a subacute apex, worn protoconch and a fine transverse sculpture on the teleoconch, obsolete spirally.

P. antiqua leonardi differs in having a subacute apex and the oblique subgranular sculpture seen on the protoconch of *P. a. rosasumma* n. ssp. that extends over the shell crossing over weaker spiral striae. It has more rounded whorls, becoming flat at the suture and the last one inflated with a subangular periphery. Shells are unicoloured, pale citrine from Ansus on Yapen Id. (Plate 1, Figure 12) and reddish from Korido on Misori (Supiori) Id., and the palatum is citrinous and brownish-red respectively. The other shell from Ansus figured here (Plate 1, Figure 17) is pale smoke grey due to post-mortem burial.

The unicoloured citrine shell of *P. antiqua horderi* (Plate 1, Figure 13) differs in having convex whorls with a finer sculpture, a slightly inflated last whorl, obsoletely angled periphery, an elevated spire and acute apex. Described as having six whorls. However, Fulton (1910b) said the count should really be 5½.

P. antiqua var. *xanthosoma* (Plate 1, Figure 14) differs in having a subobtuse apex, pale orange paries, whitish palatum and fewer whorls (4½). The impressed suture is shallower and margined below by an impressed line. Pilsbry originally described it as being lemon yellow and paler on the last whorl, and has since faded to a straw colour. The flatter look of the early teleoconch is due to a growth error.

Papuina translucida (Quoy & Gaimard, 1832) (Plate 1, Figures 6 and 18) has a fragile to solid, diaphanous to translucent and often larger shell with an acute apex and higher whorl count (6). The flattened whorls are shouldered above and subangular at the periphery, and the last one is large with an angular to subrounded base. Shell is albous (matte white) or albidous (dull whitish) with a cord-like sutural margin and a coarser sculpture of distinct spiral striae and plicae. Aperture is flared, outer lip is effuse peripherally and crenulated behind. The pyramidal spire often has its top broken off. Columellar tooth is often much larger, and ridge-like.

ACKNOWLEDGMENTS

We owe many thanks to Jonathan Ablett, Curator (of Non-Marine Mollusca and Cephalopoda, Division of Invertebrates, Zoology Department, NHMUK), for assistance in depositing type material of *Papuina antiqua rosasumma* n. ssp.

LITERATURE CITED

The Academy of Natural Sciences of Drexel University, 2019. '*Helix antiqua* var. *xanthosoma*,' Image: holotype ANSP 31545. Malacology Collection database. [Accessed: 26 December 2019] <http://clade.ansp.org/malacology/collections/images/cache/Fullsize/031/31545_Helix_antiqua_xanthosoma_apt.jpg>

Benthem Jutting, W.S.S. van 1962. 'Selection of lectotypes of non-marine Mollusca of New guinea, described by Tapparone Canefri, and now preserved in the Museo Civico di Stroia Naturale "Giacomo Doria" in Genoa.' Annali del Museo Civico di Storia Naturale di Genova 73:1-18, f. 1-10. *Papuina antiqua leonardi* p. 13, pl. 2, f. 10.

Benthem Jutting, W.S.S. van 1965. 'Non-marine Mollusca of West New Guinea,' Part 4, Pulmonata, 2. Nova Guinea 32:205-304, pls. 7-10, f. 1-12. *Papuina* (*Hombronula*) *antiqua* pp. 284-285, unfigured; *P.* (*H.*) *antiqua* var. *xanthosoma* p. 285, unfigured.

Fulton, H.C. 1910a. '(52.) List with Notes on some Land-Shells from the Island of Muswar, Dutch New Guinea, and Descriptions of new Species and Varieties of *Planispira* (*Cristigibba*), *Papuina*, *Calycia*, and *Leptopoma*.' Annals and Magazine of Natural History (ser. 8) 5(28):370-373. *Papuina antiqua* Muswar Id. p. 371.

Fulton, H.C. 1910b. '(20.) Additional Notes on a Collection of Land-Shells from Muswar Inland, New Guinea.' Annals and Magazine of Natural History (ser. 8) 6(32):211. *Papuina antiqua* Muswar Id.

Museum für Naturkunde, 2019a. '*Papuina antiqua*,' Image: specimen shell ZMB.Mol.62584. Global Biodiversity Information Facility online database. [Accessed: 20↱ April↱ 2019] < http://gbif.naturkundemuseum-berlin.de/CDV2018/Mollusken/Arten/ZMB.Mol.62584_3.jpg >

Museum für Naturkunde, 2019b. '*Papuina antiqua*,' Image: specimen shell ZMB.Mol.105527. Global Biodiversity Information Facility online database. [Accessed: 20↱ April↱ 2019] <http://gbif.naturkundemuseum-berlin.de/CDV2018/Mollusken/Arten/ZMB.Mol.105527_3.jpg>

Museum für Naturkunde, 2019c. '*Papuina leonardi*,' Image: specimen shell ZMB.Mol.122095. Global Biodiversity Information Facility online database. [Accessed: 20↱ April↱ 2019] <http://gbif.naturkundemuseum-berlin.de/CDV2018/Mollusken/Arten/ZMB.Mol.122095_3.jpg>

Pilsbry, H.A. 1891-92. 'Manual of Conchology, Structural and Systematic, with illustrations of the species,' second series Pulmonata. Vol. 7, Helicidae (Vol. 5). Conchological Section, Academy of Natural Sciences of Philadelphia, PA: (1891, 25-26) 1-64 & 65-128; (1892, 27-28) 129-192 & 193-225; 61 plates. *Papuina antiqua* p. 28, pl. 14, f. 56-57 & pl. 17, f. 39; *P. antiqua* var. *xanthosoma* pp. 28-29, pl. 17, f. 36; *P. antiqua horderi* p. 29, pl. 14, f. 58; *P. antiqua leonardi* p. 32, unfigured.

Order your San Diego Shell Club collectible mugs in our latest design - while supplies last. **NOW $10 each**, plus 8% sales tax and shipping at actual costs. These 11 ounce mugs are great for coffee, tea or hot cocoa anytime. We accept PayPal for your convenience. *See* www.sandiegoshellclub.com

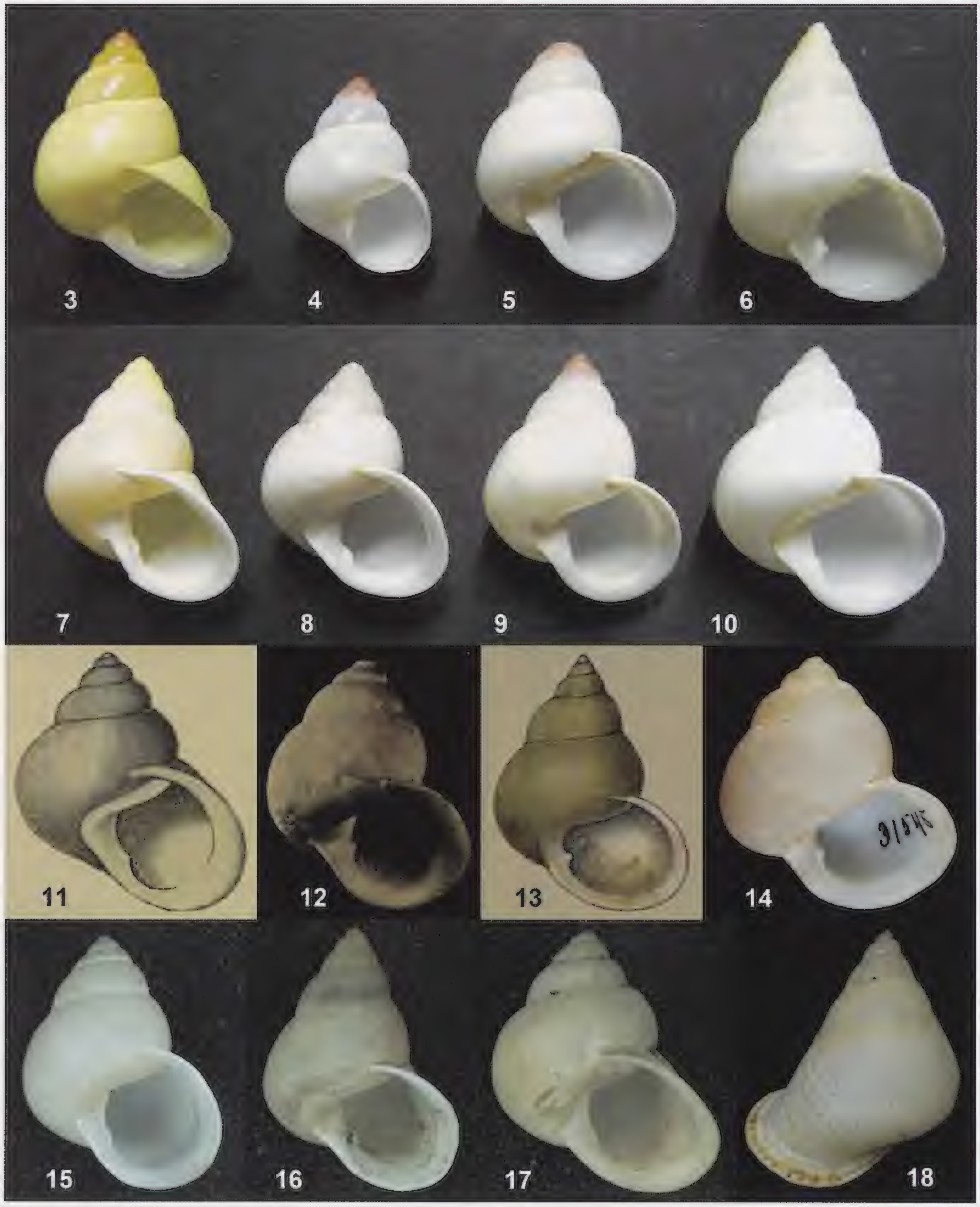


Plate 1. Comparison of the *Papuina antiqua* complex with *P. translucida*.
First row, Figures 3-5. *Papuina antiqua rosasumma* n. ssp., **3.** Paratype 1, **4.** Paratype 2 and **5.** Paratype 3; **Figure 6.** *P. translucida* Manokwari (JP); **Second row, Figures 7-8.** *P. antiqua* Yapen Id. (JP); **Figures 9-10.** *P. antiqua rosasumma* n. ssp. non-types (JP); **Third row,** Type shells: **Figure 11.** *P. antiqua* Unsang, Borneo Holotype; **Figure 12.** *P. antiqua leonardi* Ansus, Giobi (Jobi, Yapen) Id., New Guinea Lectotype; **Figure 13.** *P. antiqua horderi* New Guinea Holotype; **Figure 14.** *P. antiqua* var. *xanthosoma* (ANSP) New Guinea Holotype. **Fourth row,** Specimen shells from New Guinea: **Figures 15-16** *P. antiqua*, **15.** Muswar Id. and **16.** Yapen Id.; **Figure 17** *P. antiqua leonardi* Ansus, Giobi (Jobi, Yapen) Id.; **Figure 18** *P. translucida* Manokwari (JA). [Image credits: 3-10 JP; 11 Pilsbry, 1891 pl. 17, f. 39; 12 van Benthem Jutting, 1962 pl. 2, f. 10; 13 Pilsbry, 1891 pl. 14, f. 58; 14 ANSP, 2019; 15-17 Museum für Naturkunde, 2019a-c; 18 JA]

ISSN 0738-9388

Volume: 52 THE FESTIVUS ISSUE 3

Two New Fossil Species of *Subpterynotus* Olsson and Harbison, 1953 (Gastropoda: Muricidae: Muricopsinae) from Southern Florida

Edward J. Petuch [1] and David P. Berschauer [2]
[1] Department of Geosciences, Florida Atlantic University, Boca Raton, Florida 33431
epetuch@fau.edu
[2] 25461 Barents Street, Laguna Hills, California 92653
shellcollection@hotmail.com

ABSTRACT Two new species of the muricid genus *Subpterynotus* Olsson and Harbison, 1953 are named from the Neogene fossil beds of southern Florida. These include *Subpterynotus gabbi* n. sp. from the Early Pleistocene (Gelasian Age) Fort Denaud Member of the Caloosahatchee Formation, and *S. feliciae* n. sp. from the Late Pliocene (Piacenzian Age) Pinecrest Member of the Tamiami Formation. Both new species had previously been incorrectly assigned to the Langhian Miocene taxon *S. textilis* (Gabb, 1872) from the Baitoa Formation of the Dominican Republic. Another Floridian species, *S. miamiensis* Petuch, 1994 from the late Piacenzian Fruitville Member of the Tamiami Formation, is redescribed and compared to *S. gabbi*, and *S. feliciae*.

KEY WORDS *Subpterynotus*, *S. textilis*, *S. miamiensis*, *S. gabbi*, *S. feliciae*, Muricidae, Florida, Dominican Republic, Baitoa Formation, Caloosahatchee Formation, Tamiami Formation

INTRODUCTION

The genus *Subpterynotus* Olsson and Harbison, 1953 encompasses four known Neogene fossil taxa and also two living species. The extant taxa are widely distributed around the planet, being known from West Africa (*Subpterynotus exquisita* (Sowerby III, 1904)) and southern Australia (*Subpterynotus tatei* (Verco, 1895)), demonstrating that the genus probably was once far more cosmopolitan than it is today. The other four known species (two described here) are all extinct and are restricted to eastern North America, being known from only the Dominican Republic in the Caribbean and southern Florida, United States. The three Florida fossil species are among the most beautiful and distinctive muricids known from the Neogene of the southeastern United States and are highly sought after by both amateur and professional paleontologists. Surprisingly, the taxonomy of this popular and prominent group of fossil mollusks has been in flux for over 100 years, with incorrect names being applied to the Florida species. This paper concentrates on the four known fossil species and attempts to rectify several taxonomic errors that have led to nomenclatural confusion within the literature.

SYSTEMATICS

Class Gastropoda
Subclass Sorbeoconcha
Order Prosobranchia
Infraorder Neogastropoda
Superfamily Muricoidea
Family Muricidae
Subfamily Muricopsinae
Genus *Subpterynotus* Olsson and Harbison, 1953

Subpterynotus textilis (Gabb, 1872)
(Figure 1)

Description. (Here reprinted from the original description, as *Murex (Pterynotus) textilis*): "Shell compressed, triangular; whorls eight, the first nuclear, the next three cancellate and showing little or no trace of varices, which show themselves on the next (fifth) distinctly from the first time, suture deep, caused by the great convexity of the whorls. Body whorl broad and flat above then very convex near the top and tapering very gradually in advance. The three varices are thick at their bases, broad acute and slightly recurved in the margin. Between each pair of varices there is one large prominent node, placed longitudinally, too broad to be called a rib. The entire surface is covered with about a dozen revolving ribs, except on the faces of the varices, where corresponding grooves take their place. Crossing these, the lines of growth are developed into minute erect plates, placed at equal distances, and arching over all the ribs and intermediate, alternating lines, so as to produce under a lens, the effect of a lace or loosely woven net. Aperture small, ovate; inner lip faintly grooved internally; canal about twice as long as mouth, and nearly, or entirely arched over. Length 1.4 inches; width .8 inches." (Gabb, 1872: 202)

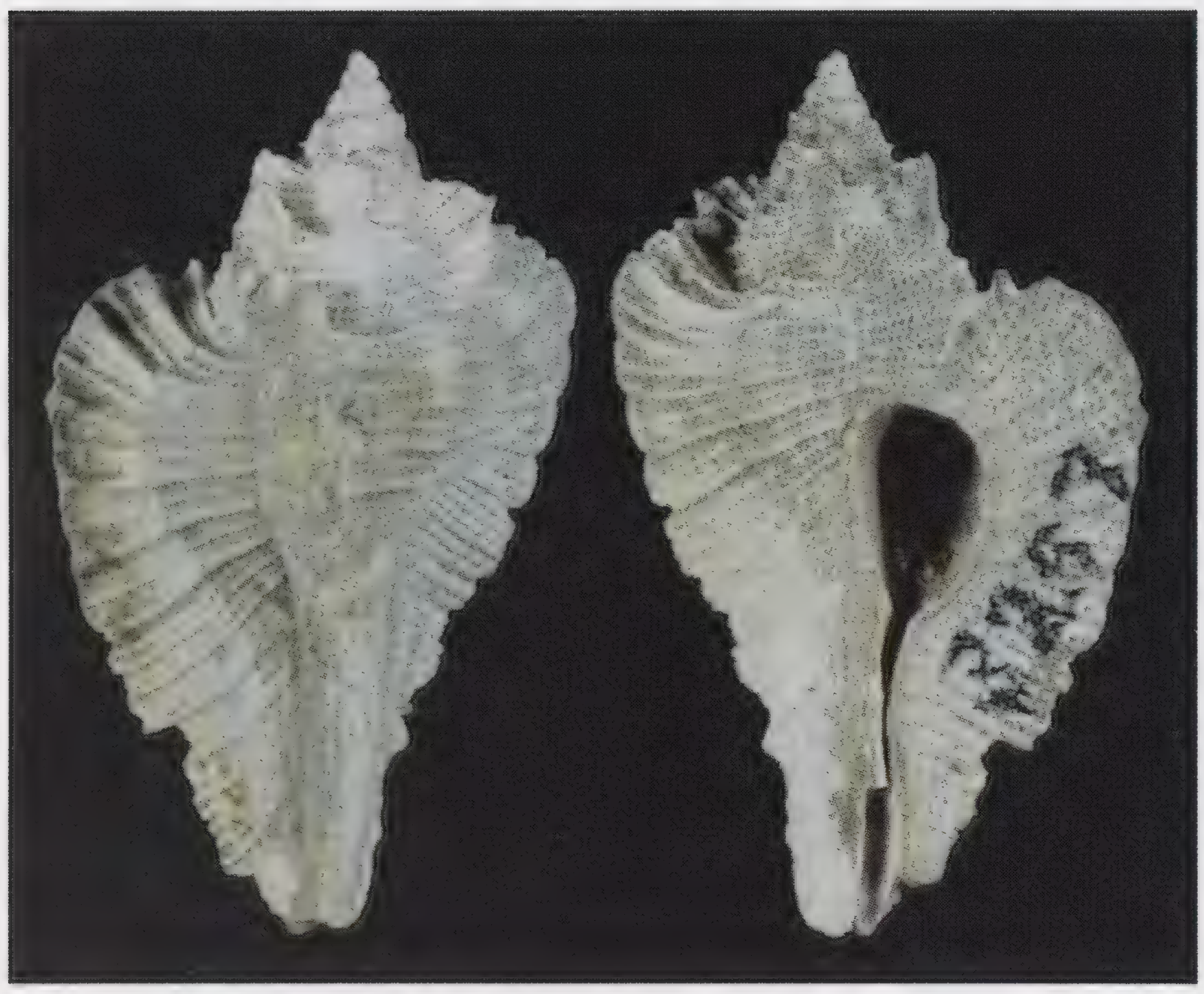


Figure 1. Holotype of *Subpterynotus textilis* (Gabb, 1872), length 35.36 mm, width 20.32 mm. ANSP 3257. From the Baitoa Formation, Dominican Republic, Langhian Age of the Early Miocene. Photo courtesy of Kathryn Estes-Smargiassi.

Type Material. HOLOTYPE - length 35.36 mm (1.4 inches), width 20.32 mm (0.8 inches), Langhian Miocene of the Dominican Republic, ANSP 3257 (Academy of Natural Sciences of Philadelphia; now the Academy of Natural Sciences of Drexel University, Philadelphia).

Type Locality. Baitoa Formation of the Dominican Republic.

Age and Stratigraphic Range. The species is restricted to beds dating from the Langhian Age of the Miocene (16 million years BP).

Distribution. *Subpterynotus textilis* is now known to have ranged from the Greater Antilles to northwestern Florida during the Miocene. The holotype was collected in the Dominican Republic, but fragmentary specimens are also known from the Chipola Formation of the Florida Panhandle (E.H. Vokes, 1989).

Etymology. Named for the cloth-like appearance of the sculpture on the varical wings; "the effect of lace or loosely woven net".

Discussion. Gabb never illustrated the type of his "*Murex (Pterynotus) textilis*", simply publishing the description seen above and relying on workers to personally examine the holotype at the Philadelphia Academy. Because the type was not figured, Dall (1890: plate 9, figure 4) illustrated a shell from the geologically much younger, Early Pleistocene (Gelasian Age) Caloosahatchee Formation, presuming that it was the same species that Gabb had named from the Miocene of the Dominican Republic. This taxonomic mistake was carried on by subsequent workers, including Pilsbry (1921: 353, plate 28, figure 4) who was the first worker to actually illustrate Gabb's holotype and stated that "This beautiful species is also found in the Pliocene of the Caloosahatchie River, Florida. It has been well figured by Dr. Dall." The

Caloosahatchee Formation specimen illustrated by Dall, and referred to by Pilsbry, is here named as a new species in the following section.

The true *Subpterynotus textilis* (first illustrated by E.H. Vokes in 1989), is a smaller shell than the three Florida fossil species shown in this paper and differs from them by having a much narrower spire with distinctly acuminate and exerted early whorls and in having a stockier, more truncated shell with a proportionally shorter siphonal canal. The rib-like, intervarical knobs on *S. textilis* are also much smaller, less developed, and far less prominent than those seen on the three Plio-Pleistocene Florida species. Like the other three fossil species, the wing-like varices, are prominent and well developed, but, unlike the other species, these are almost flattened and only slightly recurved. The aperture of *S. textilis* is also proportionally much larger than the apertures of its Floridian descendant species, giving it a more inflated and broader appearance. The fragmentary specimens of *S. textilis* found in the Chipola Formation of northwestern Florida (roughly contemporaneous with the Dominican Baitoa Formation; see E.H. Vokes, 1989) compare well with Gabb's type (see Figure 1), demonstrating that the species had a wide range across the Miocene Caribbean and Floridian region. Several other Baitoa species are also known from the Chipola Formation, including *Vasum haitense* (Sowerby, I, 1850) (Turbinellidae-Vasinae), *Plochelaea crassilabrum* Gabb, 1872 (Mitridae), and *Potamides suprasulcatus* Gabb, 1872 (Potamididae).

Subpterynotus gabbi Petuch and Berschauer, new species
(Figure 2A, B)

Description. Shell large for genus, reaching lengths of 70 mm, elongated, club-shaped, with elevated spire whorls and rounded shoulder; suture of spire whorls deeply impressed, forming distinct channel, distinctly canaliculate; body whorl rounded and inflated, widest across shoulder area, tapering gradually to sharp anterior tip of siphonal canal; entire shell covered with dense filigree of very small, fine, curved scales, which become larger and better developed on wing-like varices; body whorl and siphonal canal fuse together without noticeable stricture; shell with 3 heavily squamous, recurved varices per whorl; posterior ends of varices project onto spire whorls, producing overlapping wings that create rose petal effect; individual varices extend anteriorly onto siphonal canal area, forming single elongated wing that runs from spire whorls to pointed tubular structure of anterior tip; intervarical areas of body whorl ornamented with single large, rounded, narrow, elongated axial rib-like knob which extends to body whorl-siphonal canal juncture; intervarical areas of body whorl with 14-16 large, squamous spiral cords; varices of siphonal canal ornamented with 12 large squamous cords and 4-6 very fine threads present between each pair of main cords; varices edged with prominent curved serrations, corresponding to primary cords; aperture proportionally large, oval.

Type Material. HOLOTYPE - length 46.7 mm, width 22.8 mm, from the Griffin Pit, Palm Beach County, Florida, deposited with LACMIP (Invertebrate Paleontology section of the Los Angeles County Museum of Natural History, Los Angeles, California) LACMIP 41974.1, LACMIP Type 14874; PARATYPES - lengths 68.0 mm and 65.3 mm, same locality as the holotype, in the research collection of the senior author; length 47.6 mm, same locality as the holotype, in the research collection of the junior author; length 41.8 mm, from the Brantley Pit, Arcadia, DeSoto County, Florida, in the research collection of the senior author.

Type Locality. Collected in the Fort Denaud Member of the Caloosahatchee Formation, in the Griffin Brother's Pit, Holey Land Wildlife Management Area, southwestern Palm Beach County, Florida.

Age and Stratigraphic Range. Restricted to beds of middle Gelasian Age, Early Pleistocene (2.2 million years BP). Known only from the Fort Denaud Member of the Caloosahatchee Formation, Okeechobee Group.

Distribution. Known only from an area of southern Florida extending from St. Petersburg, Pinellas County, south to DeSoto County, and extending southeastward to Palm Beach County.

Etymology. Named for Professor William More Gabb (1839-1878), renouned pioneer American paleontologist and geologist, whose research in the Dominican Republic, Costa Rica, Baja California, and the American West led to the publication of many classic papers and texts on molluscan paleontology. His brilliant career was tragically cut short when he died at a young age from the complications of malaria, which he had contracted while working in Costa Rica. Professor Gabb also conducted anthropological research while studying the geology of Costa Rica, which resulted in the publication of the classic ethnological text "On the Indian Tribes and Languages of Costa Rica" (1875).

Discussion. This large and distinctive species was chosen by W.H. Dall for his illustration of Gabb's "*Murex (Pterynotus) textilis*", stating that "This fine species, never adequately figured, is here illustrated from a Florida specimen collected on the Caloosahatchie [sic] by the writer" (Dall, 1890: 142, plate 9, figure 4). This mischaracterization of a Miocene shell being the same species as an Early Pleistocene one was the beginning of a series of misidentifications that have persisted up to the present day. Besides being separated in time by over 13.8 million years, *Subpterynotus gabbi* differs considerably from its Miocene ancestor, by being a much larger, more elongated shell with much finer and more delicate spiral cord sculpture on the body whorl and varices. Proportionally, the varices on *S. gabbi* are much wider, broader, better developed, and more recurved than those on *S. textilis*, and the siphonal canal is also longer. The posterior ends of the varices of *S. gabbi* extend well onto the spire whorls, forming overlapping, petal-like curls, while those of *S. textilis* extend only onto the penultimate whorl, leaving most of the spire exposed, without strong varical sculpture. Olsson and Harbison (1953), the authors of the genus, illustrate two specimens of *S. gabbi* from the Caloosahatchee beds at St. Petersburg (as *textilis*, plate 36, figures 7 and 7A), and these records represent the northernmost locality from which the species has been collected. Comparisons of *S. gabbi* with the other two Floridian species, *S. feliciae* n. sp. and *S. miamiensis*, are given in the following sections.

Subpterynotus feliciae Petuch and Berschauer, new species
(Figure 2C, D)

Description. Shell of average size for genus, reaching lengths of 50 mm, elongated, club-shaped, with elevated, protracted spire whorls and rounded shoulder; suture of spire whorls impressed, forming distinct channel; body whorl rounded and inflated, widest across shoulder area, tapering gradually to sharp anterior tip of siphonal canal; entire shell covered with dense filigree of very small, fine, curved scales, which become larger and better developed on wing-like varices; body whorl and siphonal canal fuse together without noticeable stricture; shell with 3 heavily squamous, recurved varices per whorl; posterior ends of varices project onto spire whorls, producing overlapping curved wings;

individual varices extend anteriorly onto siphonal canal area, forming single elongated wing that runs from spire whorls to pointed tubular structure of anterior tip; intervarical areas of body whorl ornamented with single large, rounded, narrow, elongated axial rib-like knob, which extends to body whorl-siphonal canal juncture; intervarical areas of body whorl with 12-14 large, squamous spiral cords; varices of siphonal canal ornamented with 10-12 large squamous cords and 4-6 very fine threads present between each pair of main cords; varices edged with prominent curved serrations, corresponding to primary cords; aperture proportionally large, oval.

Type Material. HOLOTYPE - length 46.6 mm, width 22.4 mm, APAC Pit, Sarasota, Sarasota County, Florida, deposited with LACMIP (Invertebrate Paleontology section of the Los Angeles County Museum of Natural History, Los Angeles, California) LACMIP 42974.1, LACMIP Type 14875; PARATYPES - lengths 54.3 mm and 49.0 mm, same locality as the holotype, in the research collection of the senior author; length 37.7 mm, same locality as the holotype, in the research collection of the junior author.

Type Locality. Collected in Unit 7 of the APAC Pit, Sarasota, Sarasota County, Florida.

Age and Stratigraphic Range. Restricted to beds of early Piacenzian Age, Late Pliocene (3.6 million years BP). Known only from the Pinecrest Member of the Tamiami Formation, Okeechobee Group (Unit 7 of the Pliocene reference section at Sarasota; see Petuch and Roberts, 2007).

Distribution. Known only from an area of southern Florida extending from Sarasota, Sarasota County, south to Naples, Collier County, and eastward to Okeechobee County.

Etymology. Named for Felicia Weisbrot Berschauer, wife of the junior author and an avid naturalist.

Discussion. Like the Pleistocene *Subpterynotus gabbi*, the Pliocene Pinecrest Member *S. feliciae* has also been referred to the taxon "*S. textilis*" in all the previous literature on southern Floridian fossil mollusks. This new species represents the oldest member of its genus in southern Florida and has only been collected from early Piacenzian beds along western Florida, from Sarasota southward. Although similar in general appearance to *S. gabbi*, the younger Caloosahatchee shell, the older, stratigraphically-lower *S. feliciae* differs in being a consistently smaller, much more slender and elongated shell with a proportionally higher, almost scalariform spire. The siphonal canal is consistently more slender and elongated and the varical wings, especially in the shoulder area, are distinctly narrower and closer to the body whorl.

Subpterynotus miamiensis Petuch, 1994
(Figure 2E)

Description. (Here reprinted from the original description): "Shell of average size for genus, club-shaped, broad across shoulder, with abrupt and noticeable constriction at juncture of body whorl and siphonal canal; 3 squamous, recurved varices per whorl; intervarical areas with one large, narrow, knoblike axial rib; intervarical areas of body whorl with 10 large, squamous spiral cords; very fine thread present between each pair of cords; siphonal canal intervarical areas with 5 large primary cords, with single secondary cord intercalated between pair of fine, threadlike tertiary cords; varices edged with curved serrations, with serrations corresponding to primary cords; aperture proportionally large, oval." (Petuch, 1994: 287-288).

Type Material. HOLOTYPE - length 42.0 mm, late Pliocene coral reef beds of Miami, UF66266 (Florida Museum of Natural History, University of Florida, Gainesville, Florida); PARATYPE - length 44.2 mm, same locality as the holotype, in the research collection of the senior author.

Type Locality. Found in construction excavations for the Lakes of the Meadows housing development, 147th and Bird Road, Miami, Dade County, Florida. The holotype and paratype were collected in fossil coral beds that were dredged during the construction of an artificial lake.

Age and Stratigraphic Range. Restricted to beds of late Piacenzian Age, Late Pliocene (2.9 million years BP). Known only from the upper beds of the Golden Gate Member (coral reef facies), Tamiami Formation (equivalent to Unit 4 of the Fruitville Member of the Tamiami Formation; see Petuch and Roberts, 2007).

Distribution. At present, known only from the type locality in Miami, Dade County, Florida.

Etymology. Named for Miami, Dade County, Florida, the type locality.

Discussion. Of the two other Floridian *Subpterynotus* species, the late Piacenzian *S. miamiensis* is most similar to the early Piacenzian *S. feliciae*, but differs in being a stockier, broader, and wider shell with a noticeably lower spire and less-elongated siphonal canal. There are fewer spiral cords on the intervarical areas and the varices are much stronger and better-developed than those seen on the older *S. feliciae*. Likewise, the large curled serrations on the edges of the varices are much stronger and more prominent than those seen on both the older *S. feliciae* and the younger *S. gabbi*, giving *S. miamiensis* a much more ornate, rugose, and spinous appearance. These serrations are often almost totally recurved, nearly touching the surface of the adjacent body whorl. This rare late Pliocene species has only been collected in the rich fossil coral reef deposits unearthed during housing excavations in Miami and the species probably inhabited the deep fore-reef areas of the giant coralline system that bordered the southern tip of Florida at that time (see Petuch, 2004; Petuch and Roberts, 2007).

ACKNOWLEDGMENTS

We wish to thank the following for their assistance in collecting and field work around southern Florida, which resulted in the acquisition of *in situ* specimens of *Subpterynotus* species and detailed stratigraphic data: Richard Duerr, Okeechobee, Florida; Eddie Matchett, Okeechobee, Florida; Clifford Swearingen, Ocala, Florida; Linda Petuch, Jupiter, Florida; William Lyons, St. Petersburg, Florida; Joseph Bucheck II, Singer Island, Florida; Brian Schnirel, West Palm Beach, Florida; Dr. Gregory Herbert, University of South Florida; Dr. Gregory Dietl, Paleontological Research Institute; Dr. Anton Oleinik, Florida Atlantic University; Charles Powell, U.S. Geological Survey (for supplying the article with the original description of Gabb's *S. textilis*); Kathryn Estes-Smargiassi, Collections Manager, Academy of Natural Sciences, Philadelphia, for photographing Gabb's holotype; and Lindsey Groves, Natural History Museum of Los Angeles, for his helpful insights.

LITERATURE CITED

Dall, W.H. 1890. Contributions to the Tertiary Fauna of Florida, with especial reference to the Miocene Silex-beds of Tampa and the Pliocene beds of the Caloosahatchie River.

Transactions of the Wagner Free Institute of Science of Philadelphia 3:1-473.

Olsson, A.A. and A. Harbison. 1953. Pliocene Mollusca of Southern Florida, with special reference to those from North Saint Petersburg. Monographs of the Academy of Natural Sciences of Philadelphia 8:1-438, plates 1-63.

Petuch, E.J. 1994. Atlas of Florida Fossil Shells (Pliocene and Pleistocene Marine Gastropods). The Graves Museum of Archaeology and Natural History, Dania, Florida. 394 pp.

Petuch, E.J. 2004. Cenozoic Seas: The View from Eastern North America. CRC Press, London, New York, Boca Raton. 308 pp.

Petuch, E.J. and C. Roberts. 2007. The Geology of the Everglades and Adjacent Areas. CRC Press, London, New York, Boca Raton. 212 pp.

Pilsbry, H.A. 1921. Revision of W.M. Gabb's Tertiary Mollusca of Santo Domingo. Proceedings of the Academy of Natural Sciences of Philadelphia 73(2):305-435, plates 16-67.

Vokes, E.H. 1989. Neogene Paleontology in the northern Dominican Republic: 8. The Family Muricidae (Mollusca:Gastropoda). Bulletins of American Paleontology 97(332):5-94, at pp. 65-66, pl. 9, fig. 1, holotype ANSP 3257.

www.seashells.net

australian seashells

seashells · décor · starfish
specimen shells · seashell books

Simone Pfuetzner · Hugh Morrison
5 Ealing Mews
Kingsley WA 6026 - Australia
Ph: +61 8 9409 9807
shells@seashells.net.au

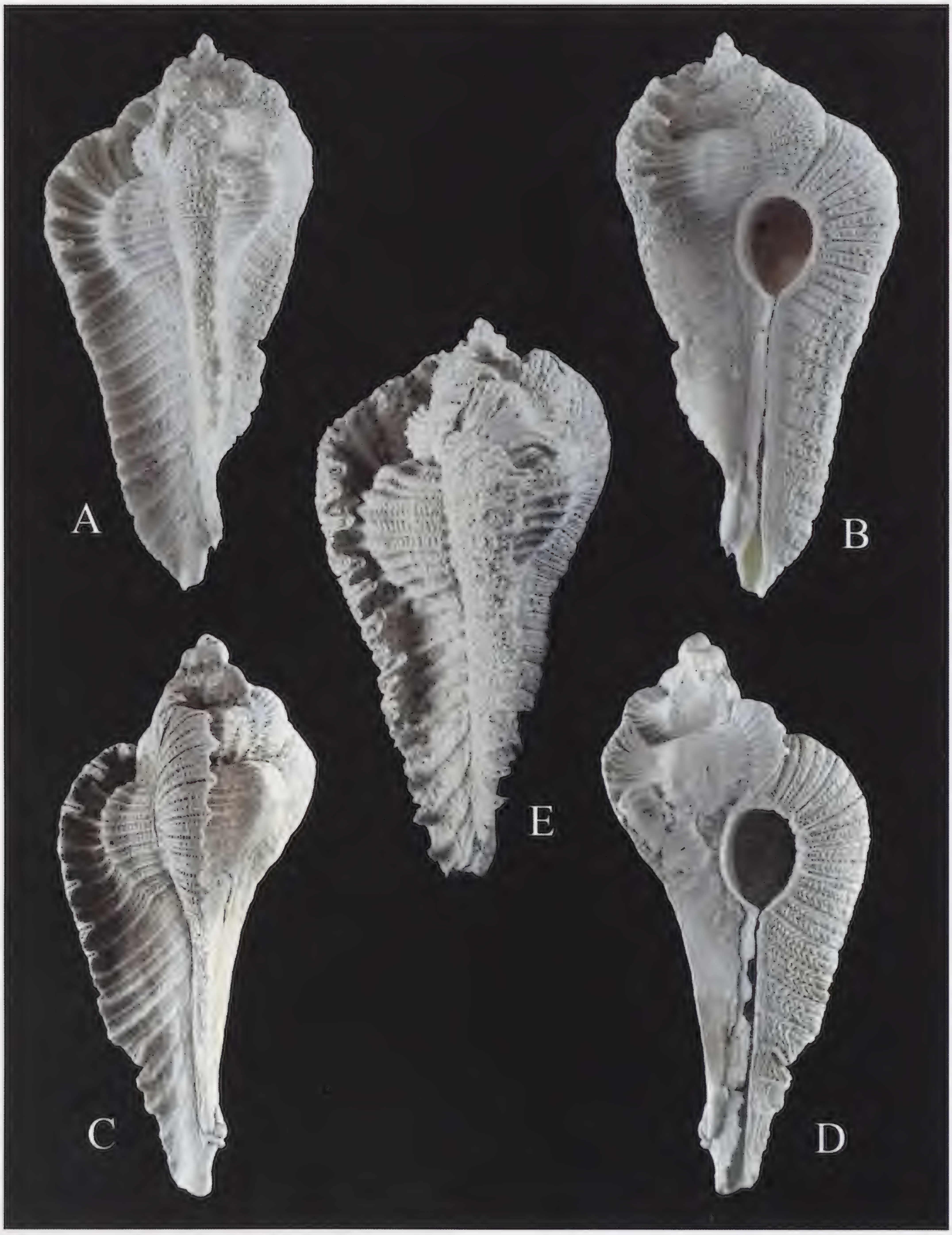


Figure 2. *Subpterynotus* species from the Pliocene and Early Pleistocene of Southern Florida.
A, B= *Subpterynotus gabbi* Petuch and Berschauer, new species, holotype, length 46.7 mm, Griffin Brothers Pit, SW Palm Beach County, Florida (Fort Denaud Member, Caloosahatchee Formation, Gelasian Age, Early Pleistocene), LACMIP Type 14874; **C, D=** *Subpterynotus feliciae* Petuch and Berschauer, new species, holotype, length 46.6 mm, Unit 7 in the APAC Pit, Sarasota, Florida (Pinecrest Member, Tamiami Formation, Piacenzian Age, Pliocene), ventral side covered with encrusting coralline algae, LACMIP Type 14875; **E=** *Subpterynotus miamiensis* Petuch, 1994, Paratype, length 44.2 mm, Bird Road excavation, Miami, Florida (basal beds of the Golden Gate Member, Tamiami Formation, early Piacenzian Age, Pliocene).

Volume: 52 THE FESTIVUS ISSUE 3

A New *Persicula* (Gastropoda:Cysticidae) from Central Brazil

José Coltro Jr.
Via alla costa, 18, Vado Ligure, SV 17047, Italia
jose@femorale.com

ABSTRACT A new small translucid *Persicula* dredged off Southern Bahia State at depths of 20 up to 30 meters is described and compared to other species.

KEY WORDS *Persicula moretzsohni* sp. nov., Alcobaça, Bahia, Brazil, Cysticidae

INTRODUCTION

For many years the author has received some small translucid *Persicula* from Southern Bahia State. Most of the specimens were hand dredged on the largest Brazilian reef complex around Abrolhos Archipelago. Apparently, this species inhabits sediment and coralline sand at depths between 20 and 30 meters.

Abbreviations:

MNHN – Muséum national d´Histoire naturelle, Paris, France
MNRJ – Museu Nacional, Rio de Janeiro, Brasil
MZSP – Museu de Zoologia da Universidade de São Paulo, São Paulo, Brasil

SYSTEMATICS

Family Cysticidae Stimpson, 1865
Subfamily Cysticinae Stimpson, 1865
Genus *Persicula* Schumacher, 1817

Persicula moretzsohni Coltro, new species
(Figure 1A-C)

Description. Shell minute, about 4-5 mm, elongated, cylindric, semi translucent, spire immersed, with three well developed plicae on the columella; color translucid white with irregular pale brown longitudinal wavy fine bands; surface smooth and glossy; aperture narrow, lip moderately thickened and with a very tiny crenulation.

Types. Holotype MZSP 152140 (4.7 mm long, 2.7mm width) (Figure 1A); Paratype 1 MNHN-IM-2012-25492 (4.3 mm long, 2.3 mm width) (Figure 1B); Paratype 2 MNRJ 23.602 (4.2 mm long, 2.2 mm width) (Figure 1C); 9 specimens from type locality, all at MZSP.

Type locality. Off Alcobaça, Bahia State, Brazil (17º30'14"S 38º48'51"W, 28 meters deep).

Habitat. Coral sand and rubble between 10 up to 30 meters deep.

Etymology. Named in honor of the late Brazilian malacologist Fabio Moretzsohn (1964-2020).

DISCUSSION

As the vast majority of small marine species off the coast of Brazil are poorly studied, the presence of a new *Persicula* is not an exceptional finding. There are probably a few more dozen species of undescribed Cysticidae along the Brazilian coast.

For the Brazilian coast, E.C.Rios (2009) showed only four Cysticidae species: *Gibberula catenata* (Montagu, 1803), a Caribbean species

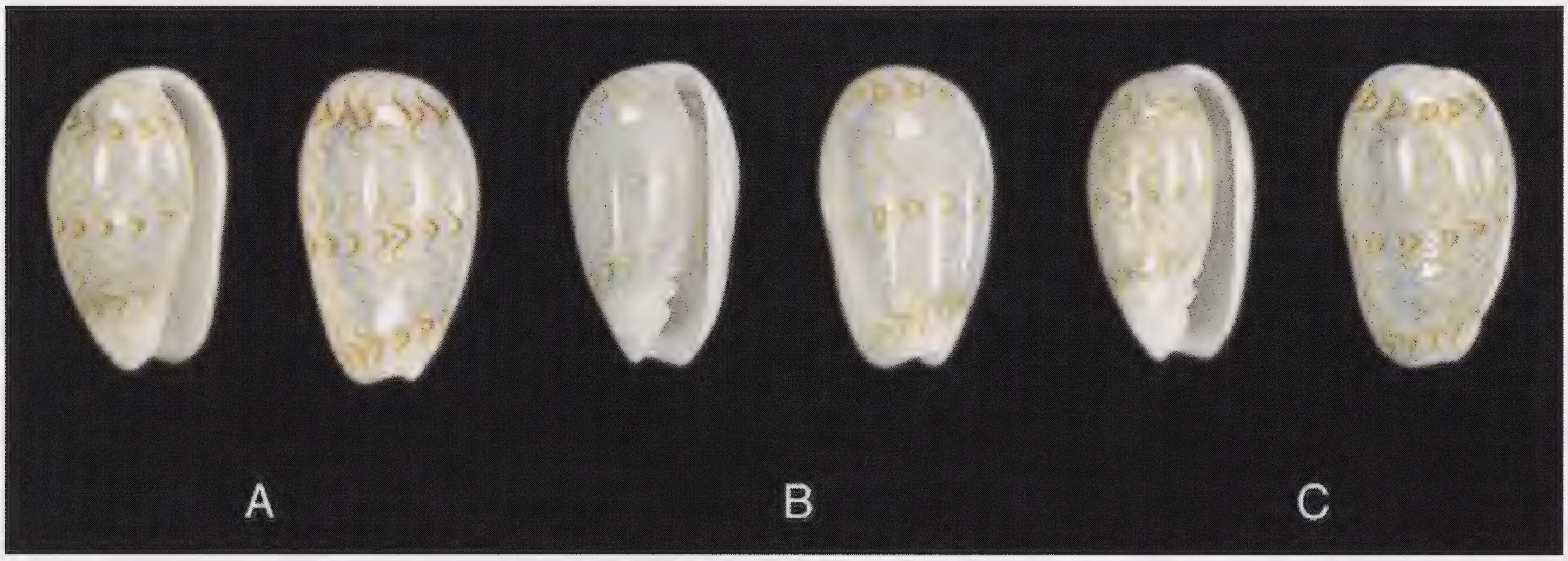


Figure 1. *Persicula moretzsohni* Coltro, new species **A**= Holotype (4.7 mm long, 2.7 mm width); **B**= Paratype 1 (4.3 mm long, 2.3 mm width); **C**= Paratype 2 (4.2 mm long, 2.2 mm width), all from Alcobaça, Bahia State, Brazil.

(Figure 2I); *Gibberula lavalleeana* (d'Orbigny, 1842); *Persicula sagittata* (Hinds, 1844) and *Granulina ovuliformis* (d'Orbigny, 1842) (now Granulinidae). Cossignani (2006) showed only three Cysticidae species: *Gibberula moscatelli* Boyer, 2004; *Persicula sagittata* and *Persicula* aff. *sagittata*. The www.femorale.com website shows images of 12 Cysticidae species from Brazil, probably most of them new to science (Figure 2C and H) except for the *P. sagittata* and *G. moscatelli*. The website www.gastopods.com show images of 5 species from Brazil: *P. sagittata, P. pulcherrima* (Gaskoin, 1849), *G. catenata, G. moscatelli* and *Granulina clandestina* (Bavay, 1908) – a European species which is now placed in the family Granulinidae.

P. moretzsohni is much closer to the Caribbean species *Gibberula fluctuata* (C.B.Adams, 1850) (Figure 2G) and *Persicula frumentum* (Sowerby I, 1832) (Figure 2F) based on size, shape and ornamentation. Both Caribbean species are more compact and slightly conic at the back. The ornamentation on *P. moretzsohni* is closer to *G. fluctuata* and the immerse spire is closer to *P. frumentum*.

Among the Caribbean Cysticidae, *P. moretzsohni* has the most pale ornamentation and it is one of the smallest species in this genus.

According to WoRMS – World Register of Marine Species (www.marinespecies.org) the separation between *Persicula* and *Gibberula* is not clear. This small species had been placed under the genus *Persicula* following Coovert G.A. & Coovert H.K. (1995). The use of the genus *Persicula* or *Gibberula* is controversial since even Coovert & Coovert (1995) do not show deep conchological differences except for the notch at the anterior end and the spire not completely immerse in *Gibberula*. However, both *Gibberula catenata* and *G. moscatelli* have the spire immersed. Further studies of this entire complex using anatomy and molecular analysis may further assist in determining which genus is most appropriate.

ACKNOWLEDGEMENTS

I am grateful to Weslley Valiant de Mattos for his work always looking for new species and to the Professor Dr. Luiz Ricardo L. Simone for his comments. Thanks also to Simone Floris for the excellent photographic work.

LITERATURE CITED

Boyer F. 2004. Les groupes *Gibberula frumentum* (Sowerby, 1832) et *G. pulchella* (Kiener, 1834) dans l'Atlantique occidental. Novapex 5(1):33-42

Coovert G.A. & H.K. Coovert. 1995. Revision of the supraspecific classification of marginelliform gastropods. The Nautilus 109(2-3):43-110.

Cossignani T. 2006. Marginellidae & Cystiscidae of the World. L'Informatore Piceno. 408 pp.

Rios, E.C. 2009. Compedium of Brazilian Seashells. Fundação Cidade do Rio Grande, Fundação Universidade do Rio Grande, Museu Oceanográfico, Rio Grande, RS, XII, Rio Grande, Brazil, 659 pp.

WoRMS – World Register of Marine Species – www.marinespecies.org

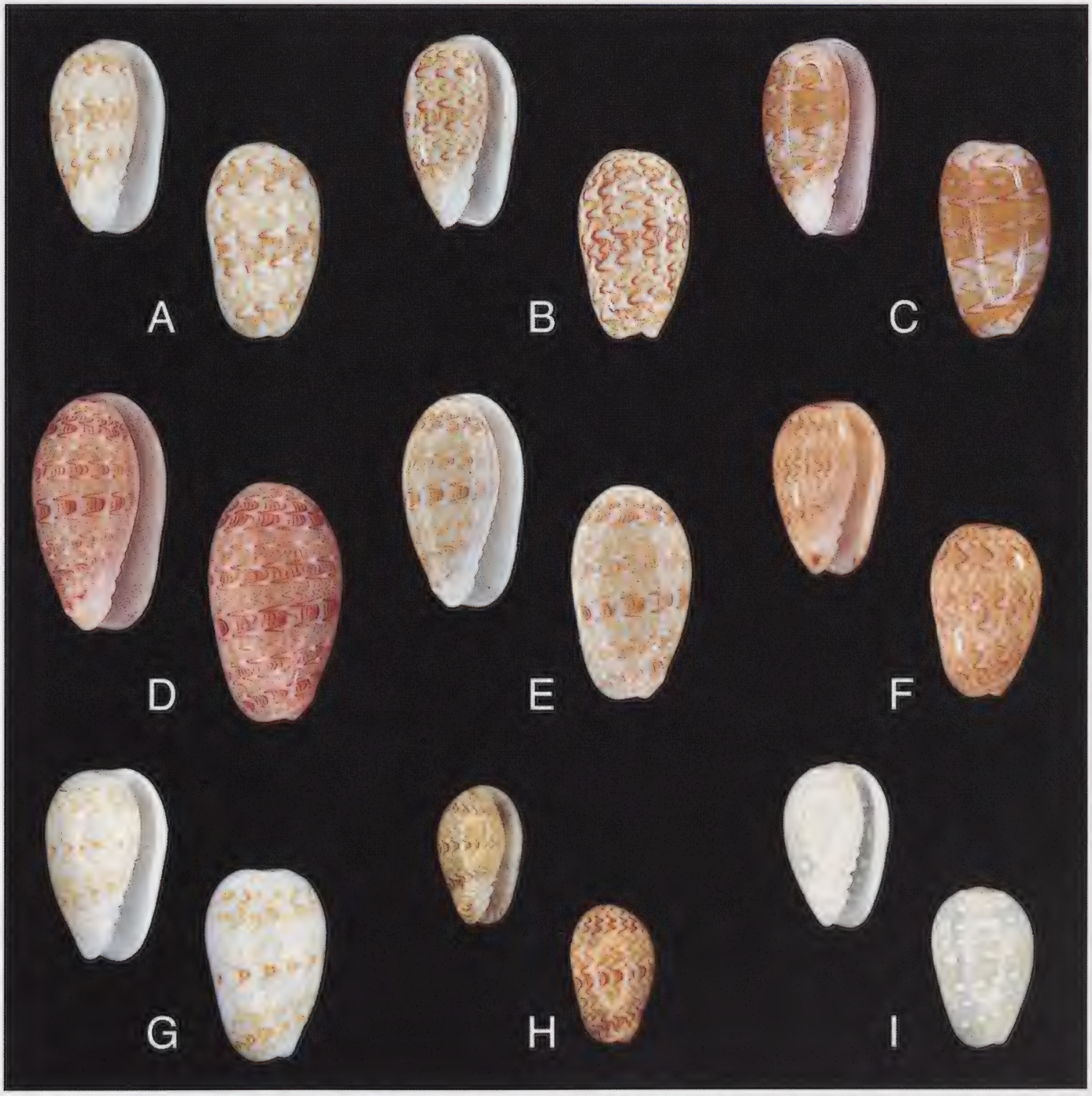


Figure 2. Comparative Cysticidae species. **A-B=** *Persicula sagittata* (Hinds, 1844) (6.2 and 6.9mm) from Fernando de Noronha Island, Brazil; **C=** *Gibberula* sp. (5 mm) from Canopus Bank, off Ceará State, Brazil; **D-E=** *Gibberula moscatelli* Boyer, 2004 (12.2 and 12 mm), from Luís Correia, Piaui State, Brazil; **F=** *Persicula frumentum* (Sowerby I, 1832) (6 mm) from Carriacou Island, Grenadines, Grenada; **G=** *Gibberula fluctuata* (C.B. Adams, 1850) (5.6 mm) from Plum Cay, Andros Island, Bahamas; **H=** *Persicula* sp. (4.2 mm) from Guarapari, Espirito Santo State, Brazil; **I=** *Gibberula catenata* (Montagu, 1803) (4.9 mm) from Big Pine Key, Florida, USA. All photos are from Femorale.

ISSN 0738-9388

Volume: 52 THE FESTIVUS ISSUE 3

A new member of the *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) group from Timor-Leste (East Timor)

Jeff Parsons [1] and John Abbas [2]
[1] 47 Elizabeth Street, Aitkenvale, Queensland, Australia 4814
jeffonese@yahoo.com.au
[2] Lihue, Kauai, Hawaii — Jalan Demaga Baru, Muara Angke,
Jakarta Utara Pos 14450, Jakarta, Indonesia john123abba@yahoo.com

ABSTRACT This paper describes a new member of the *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) group from Timor-Leste (East Timor). Although variable in shape, it is easily separated from the nominate subspecies and shares features with other members of the group, especially patterns. It differs in having its umbilicus closed or almost so, and has at least six colour forms, whereas other members of the group usually have only three colour forms.

KEY WORDS *Amphidromus*, *A. timorensis*, *A. contrarius,* Tutuala, Timor-Leste (East Timor)

INTRODUCTION

Earlier this year, John searched for a local living in Timor-Leste (East Timor) for the purposes of acquiring species of *Amphidromus* Albers, 1850. Having found such a person, John asked him to start looking in the forests west of Tutuala in May 2020. Weeks later, he sent John a photo of *Amphidromus* snails he had discovered. From that one photo it was clear these were not like any species we knew of from that part of the island. It is a new member of the *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) group and described herein as a new species until preserved live specimens can be studied and proven otherwise.

Materials and Methods.

Shells were measured using digital Vernier callipers (0.01 mm resolution), sculpture examined under low magnification (10x) using a jeweller's loupe, and weighed using a pocket-sized electronic scale (capacity 300 g x 0.01 g). Whorl count includes the apex and counted precise to 0.125 (⅛ whorl). ‘Paries’ (adj. parietal) refers to the ‘inner apertural wall’ and ‘palatum’ (adj. palatal) is the ‘outer apertural wall’. Relative shell sizes for the subgenus *Syndromus* mentioned are as follows: small < 30 mm, medium 30-45 mm and large > 45 mm.

Five shells make up the type series, the holotype (NHMUK) and 4 paratypes (JA). Photography credits appear below each image and the plate. The species description and variation were determined from dry empty shells obtained for John Abbas by a local in East Timor. Comparative material comprised of shells from private collections, plus images of museum specimens and types.

Abbreviations used for museums and private collections:

NHMUK:	Natural History Museum, London, England, UK
ZMB:	specimen label code at Museum für Naturkunde, Berlin, Germany; previously known as Zoologisches Museum Berlin
JA:	John Abbas collection
JP:	Jeff Parsons collection

Abbreviations for shell morphometry, shell coiling and other:

D:	shell width (abbreviation for 'diameter' as per literature usage)
H:	shell height
H/D:	shell height/shell width ratio
N:	whorl count
W:	shell weight
JP	comments, data, images, observations or other by Jeff Parsons

Taxonomic Remarks.

The concept of the *A.* (*S.*) *contrarius* group used here is a modified version of that stated by Severns (2006) and is here split into 3 clades: 1) *A.* (*S.*) *contrarius*, 2) *A.* (*S.*) *laevus* (Müller, 1774) and 3) *A.* (*S.*) *reflexilabris* Schepman, 1892. Only members of the *contrarius*-clade are discussed herein as the new species is a new member of it and distinctly different to members of the other two clades.

In recent times, specimens of *A.* (*S.*) *contrarius* have been sold and displayed on the Internet under the name of *A.* (*S.*) *con. baaguiae* Forcart, 1936 (see plate 2, figure 26). That is incorrect as that subspecies is known only to live in the Baguia Subdistrict (Baquia, Bagia, obsolete: Baaguia) in SE Baucau District of Timor Leste, which is about 60 km WSW of Tutuala on the eastern tip of Timor Island.

We wish to correct three incorrect species associations: *Amphidromus berschaueri mingmini* Thach, 2018, *A. chrisabbasi roberti* Thach, 2017 and *A. bernardfamyi kefaensis* Thach, 2018. These snails show greater affinities to members of the *A.* (*S.*) *contrarius* clade and hereafter placed there. We accept one as a full species until confirmed otherwise, *A.* (*S.*) *mingmini*. For purposes of this paper *A.* (*S.*) *chrisabbasi roberti* is considered as a synonym of *A.* (*S.*) *con. albolabiatus* Fulton, 1896 as per the decision of Páll-Gergely et al, 2020. After studying multiple specimens of shells from Kefa, we believe *A.* (*S.*) *kefaensis* and *A.* (*S.*) *keppensdhondtorum* Thach, 2018 are only shape and pattern variations of single species, since specimens identified as both occur with intergrades in the same colony, and henceforth *A.* (*S.*) *kefaensis* is regarded as a synonym of *A.* (*S.*) *keppensdhondtorum.*

SYSTEMATICS

Family: Camaenidae Pilsbry, 1895
Subfamily: Camaeninae Pilsbry, 1895
Genus: *Amphidromus* (m.) Albers, 1850
Subgenus: *Syndromus* (m.) Pilsbry, 1900
Type species: *Helix contraria* (f.) Müller, 1774

Amphidromus (*Syndromus*) *timorensis*
Parsons and Abbas new species
(Figure A and Plate 1)

Description. (Holotype) Shell medium-sized, sinistral, ovate-conic, moderately thick, translucent and solid. Spire long and summit rounded. Surface shiny and protoconch smooth; teleoconch with obsolete spiral microstriae crossed by growth threads, slightly coarser on last whorl. Whorls 6¼, regularly coiled and gradually expanding, upper surface subconvex. Last whorl not descending in front, its periphery and base rounded. Suture impressed apically and appressed below periphery on teleoconch; white-margined and bordered below by a rose subsutural band from third whorl onward. Periostracum removed.

Protoconch 1½ whorls, pale flesh and rotund. Apex rounded, exsert and black, continued as an infrasutural fillet (apical swirl) that narrows and fades-away on second whorl. Teleoconch flesh-tinted apically, next ones white and ultimate pale cream. Two series of pale brown blotches emerge on second whorl, darken and then tinted purple and partially faded on antepenult, split on penult and fuse as brown spiral lines on last whorl, crossed by dilution streaks. Yellow supermedial band on third and fourth whorls is evanescent on penult. Base has two brown lines between two purplish-brown bands, upper one partially interrupted by a few spirally-elongated cream blotches.

Circumumbilical band rose, thin, obsolescent and does not exit the aperture, bordered above by a narrow brown band. All bands and lines fall short of outer lip. Stripes marking growth stoppages (morae) absent.

Aperture suboblique, narrowly ovate. Palatum cream, whitened near lip and external pattern shows through. Parietal callus very thin and colourless. Parietal tubercles absent. Outer lip gleamy white, thin but thickened inwardly, strongly reflected and very narrowly expanded; edge not rimmed, flat; lateral profile rather straight. Lip terminus non-ascending, slightly curved forward and weakly grooved. Columella gleamy white, narrow, suberect and slightly twisted, curved dorsally. Columellar margin thickened, subulate, convexly dilated above and revolute, closing the umbilicus.

Type Material. 5 adult shells, all from the type locality. Holotype (NHMUK 20200247, figure A and plate 1, figure 2) H 40.8 mm, D 18.66 mm, H/D 2.19 and N 6.25. Paratypes (JA, plate 1, figures 5, 7, 11 and 18) not measured.

Other Material. 15 adult shells from the type locality (JA, plate 1, figures 1, 3-4, 6, 8-10, and 12-17) not measured.

Type Locality. Easternmost tip of Timor Island at Tutuala Subdistrict, Lautém District, Timor-Leste (East Timor).

Distribution. Currently known only from the type locality.

Ecology/Habitat. Found on tree trunks in vine thicket and lowland limestone forest, collected by a local for John Abbas.

External Features of Animal. Unknown.

Soft Parts. Not available for study.

Etymology. Named after the island of Timor.

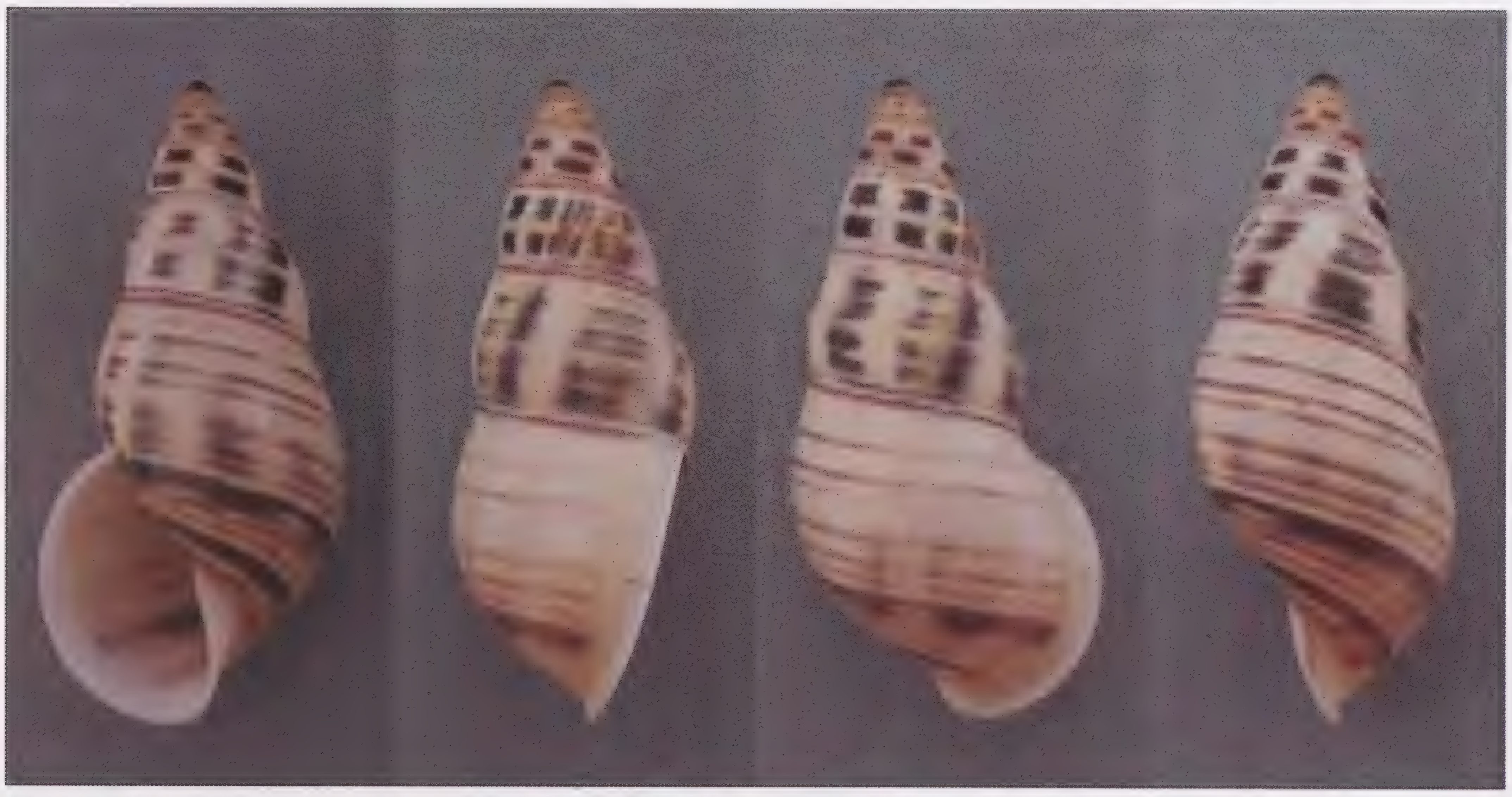


Figure A. Holotype of *A.* (*S.*) *timorensis* n. sp. NHMUK 20200247 [Photos by JA]

Shell Variation. (Plate 1) Upper teleoconch usually albous (dull white), sometimes same colour as protoconch post-apically. Lower whorls albous (Figure 6), creamy (Figure 7), pale yellow (figure 4), brown [pinkish- (Figures 11-15) or vinaceous-tinted (figure 19), hazel or chestnut], olive-green or pale pink. Sometimes most of shell is orange-brown (rufous, Figure 13) or very rarely patternless and yellow. Protoconch whitish (Figure 1), orange-brown (Figure 4), brown (Figure 8), pale flesh (Figure 6) or creamy (Figure 19). Apex usually black, sometimes not coloured (Figures 3, 4, 11 and 13) or continued as a black suprasutural band. Periostracum plain, pale ochraceous buff (figure 16). The palatal and external coloration is usually the same due to translucency of the palatum: white, creamy, pale yellow or brown inside and outside. During shell maturity the palatum is whitened as it is thickened and reducing the external colour shining through, as seen in the three brown morphs. However, rarely white shells have a yellow palatum.

Pattern elements variable on a single shell as per holotype, pattern faded (Figure 12) or lost (Figure 19) on lower whorls, or the same pattern type continues onto the last whorl (Figure 20). Patterns include banded (Figure 3), striped (Figure 6), chequered (Figure 5) or a mixture (Figure 1). Subsutural band is rarely absent (Figure 3), sometimes obsolescent (Figure 7) and usually pink-rose, but also red or purple tinted. Circumumbilical band rose with or without a narrow brown band bordering above, often obsolescent and does not exit the aperture or sometimes absent. Some shells have a growth stoppage on the spire, marked an opaque greyish resting line representing the former lip of a resting stage and usually preceded by a coloured stripe (mora). A mora is brown, blackish-brown, yellow-brown (Figures 7 and 14) or pale yellow, and may also appear behind the lip (Figures 11 and 13). Three basic shell shapes: as per holotype, longer attenuated spire (Figure 3) and short spire with an inflated last whorl (Figure 10).

DISCUSSION

A. (*S.*) *timorensis* n. sp. differs from the nominate subspecies in lacking parietal tubercles and having the lip terminus fused to the body whorl, an indentation is present there but not a groove or channel. It differs from all other members of the group in having a revolute columellar margin that covers the umbilicus, either occluding it (closed) or leaving a very thin gap (finely rimate) only visible with a hand lens and a greater number of colour forms. Similar to some other taxa in sometimes being weakly compressed subsuturally when lower whorls develop below the periphery of preceding whorls, which causes a usually impressed suture to become appressed.

The following taxa **differ in developing parietal tubercles and lip terminus not fused to body whorl with a narrow sinus beside it forming a gap** (see Plate 2):

A. (*S.*) *contrarius* (Figure 21), its colour variant *A.* (*S.*) *con.* var. *subconcolor* (von Martens, 1867) (Figure 25) and subspecies *A.* (*S.*) *con. suspectus* (von Martens, 1864) (Figures 23-24) all differ in having parietal tubercles. A mature anterior or parieto-columellar (P-C) tubercle is a falcate or straightened ledge, and the posterior or parieto-labral (P-L) tubercle is a subtriangular lump separated from the lip terminus by a narrow sinus (gap present) continued as a channel along the suture inside. At full maturity both tubercles may be connected by a thickened parietal margin (Figure 21). All three are similar to *A.* (*S.*) *timorensis* n. sp. in having a dark apex or first whorl, thin white lip and growth stoppages marked by a grey resting line with a yellow or white mora, sometimes absent, except *A.* (*S.*) *con. suspectus* usually has a blackish mora. All differ in commonly have the last whorl more expanded than spire whorls.

A. (*S.*) *contrarius* has similar yellow or whitish submedial and supermedial bands, except the wider lower one is often bordered by the two dark basal bands and dark bands commonly border the upper one, solid or broken. It is similar in having rose subsutural and circumumbilical bands; a white, brownish or pink protoconch; pale yellow, albous or pale flesh lower whorls; and rarely with the upper surface banded on lower whorls. Differs in having flammules that typically stop at the upper basal band and sometimes with a purplish or greenish suffusion between pattern elements on the last whorl.

A. (*S.*) *con. suspectus* is similar to some *A.* (*S.*) *timorensis* n. sp. with pale yellow or albous lower whorls in having a white or rarely pink protoconch; rose circumumbilical band and rarely having chequered early whorls that form spiral bands on lower whorls (Figure 24). Differs in typically being buff-whitish with two dark basal bands and thinner yellow submedial and supermedial bands; a blackish stripe behind a violaceous-brown lip and paler columellar margin, columella whitish internally; and lacks a rose subsutural band. It sometimes has white-lipped forms (Figure 23).

The following taxa are **similar in having the lip terminus fused to the body whorl and a thin white lip, and differ in occasionally developing parietal tubercles:**

A. (*S.*) *rottiensis* Chan & Tan, 2010 (Plate 2, Figures 33-36) sometimes form white parietal tubercles in mature snails like those of *A.* (*S.*) *contrarius* (Figure 36), however the P-L tubercle is "fused" to the lip terminus. It is similar to *A.* (*S.*) *timorensis* n. sp. in having white, yellow or pink (Figure 35) lower whorls and a flammulate or chequered pattern. Differs in having a more stable shape and two-banded morph with white or yellow lower whorls that has a yellow subsutural band and lacks a coloured circumumbilical band (Figure 33).

Considering only the type shell, *A.* (*S.*) *con. albolabiatus* (Plate 2, Figure 28) differs in having a weak P-C tubercle, which is a very thin, white smudge of callus and no P-L tubercle. It is similar to some *A.* (*S.*) *timorensis* n. sp. in having an indentation beside the fused lip terminus, faint or obsolescent pinkish subsutural band, pinkish circumumbilical band and a non-black apex. Differs in having a sub-turreted lower spire due to more convex lower whorls that are narrowly compressed subsuturally with an appressed suture, whitish palatum and two brown basal bands on a creamy back ground.

Taxa without parietal tubercles.

The following taxa **differ in having the lip terminus not fused to the body whorl with a narrow sinus beside it:**

A. (*S.*) *con. rolfei* Thach, 2018 (Plate 2, figure 22) similar to *A.* (*S.*) *contrarius* in pattern, shape, etc. but smaller. Differs from *A.* (*S.*) *timorensis* n. sp. in having a reddish-brown subsutural band, chocolate last whorl and protoconch, pale greyish-pink lip and circumumbilical band absent.

A. S.) *keppensdhondtorum* (Plate 3, Figures 45-48 and synonym "*kefaensis*" Figures 41-44) and *A.* (*S.*) *con. nikiensis* Rensch, 1931 (Plate 3, Figures 49-51) both have similar patterns to *A.* (*S.*) *timorensis* n. sp., especially chequered or axially aligned dashes forming stripes. Comparing shells with white or yellow lower whorls, both are similar in having a faded pattern on the last whorl; whitish or brownish protoconch; subsutural band is rose or absent; and may have yellow submedial and supermedial bands with the lower one wider; and two dark basal bands. Both differ in having a distinctly appressed suture on mid to lower whorls and shells with elongated or inflated whorls tend to have subsutural compression and a turreted spire; circumumbilical band that exits the aperture and is rose, brown or absent; and commonly lacking a pattern on lower whorls or most of the shell. Their palatum is either white or brownish-yellow internally, often whitened near the lip, regardless of external colour; it is faint in *A.* (*S.*) *keppensdhondtorum* and pale to dark in *A.* (*S.*) *con. nikiensis* even in brown morphs.

A. (*S.*) *keppensdhondtorum* is similar in occasionally forming a two-banded morph with residual markings on early whorls (Figure 48). It differs in having the apex dark on patterned shells and an uncoloured on the two-banded morph.

A. (*S.*) *con. nikiensis* is similar in having pinkish- or purplish-brown lower whorls (Figure 50), a black suprasutural band or flammulate pattern; and the apex is dark-coloured or not. It differs in producing banded shells like those of the *A.* (*S.*) *laevus* (Müller, 1774) subspecies (Figure 52) and sometimes has a brown subsutural band.

The following taxa are **similar in having the lip terminus fused to body whorl and differ in lacking an indentation beside it or a groove below it:**

A. (*S.*) *con. baaguiae* (Plate 2, Figure 26) known only from the types. Its whitish submedial and supermedial bands are narrower and bordered by thin dark bands, solid on lower one and broken on upper one, which is similar to some *A.* (*S.*) *timorensis* n. sp. in fading-away on the spire. Similar in having a whitish protoconch, black apex and flammules almost reaching the umbilicus. Differs in having more convex whorls; distinctly ascending lip terminus; somewhat flared lip; solid brown flammules that change to purple on last whorl and sometimes forked; paler periostracum; and lacks subsutural and circumumbilical bands.

ACKNOWLEDGMENTS

We would like to thank the locals for sending John Abbas the types of this new species, and Jonathan Ablett, Curator (of Non-Marine Mollusca and Cephalopoda, Division of Invertebrates, Zoology Department) (NHMUK) for assistance in depositing the holotype.

LITERATURE CITED

Köhler, F. 2012a. *Amphidromus contrarius* var. *subconcolor*, Image: ZMB 5638. Privately acquired 18 Jan 2012.

Köhler, F. 2012b. *Amphidromus contrarius baaguiae*, Image: ZMB 87424. Privately acquired 18 Jan 2012.

Natural History Museum, 2017. *Amphidromus contrarius crassus*, Image: NHMUK 1896.6.13.41. Dataset: Collection specimens, Natural History Museum Data Portal (data.nhm.ac.uk). [Retrieved: 30 Nov 2017] <https://data.nhm.ac.uk/object/853b6ba0-2491-43ef-8acc-de3edc67a37/1594771200000>

Natural History Museum, 2018. *Amphidromus contrarius albolabiatus*, Image: NHMUK 1896.6.13.41. Dataset: Collection specimens, Natural History Museum Data Portal (data.nhm.ac.uk). [Retrieved: 30 Sep 2018] <https://data.nhm.ac.uk/object/c1e11d2f-8809-4060-b0b0-161016c960f5/1592265600000>

Páll-Gergely, B., A. Hunyadi, and K. Auffenberg. 2020. Taxonomic vandalism in malacology: comments on molluscan taxa recently described by N. N. Thach and colleagues (2014-2019). Folia Malacologia 28(1):35-76.

Severns, M. 2006. 'A new species and a new subspecies of *Amphidromus* from Atauro Island, East Timor (Gastropoda, Pulmonata, Camaenidae),' Basteria 70:23-28.

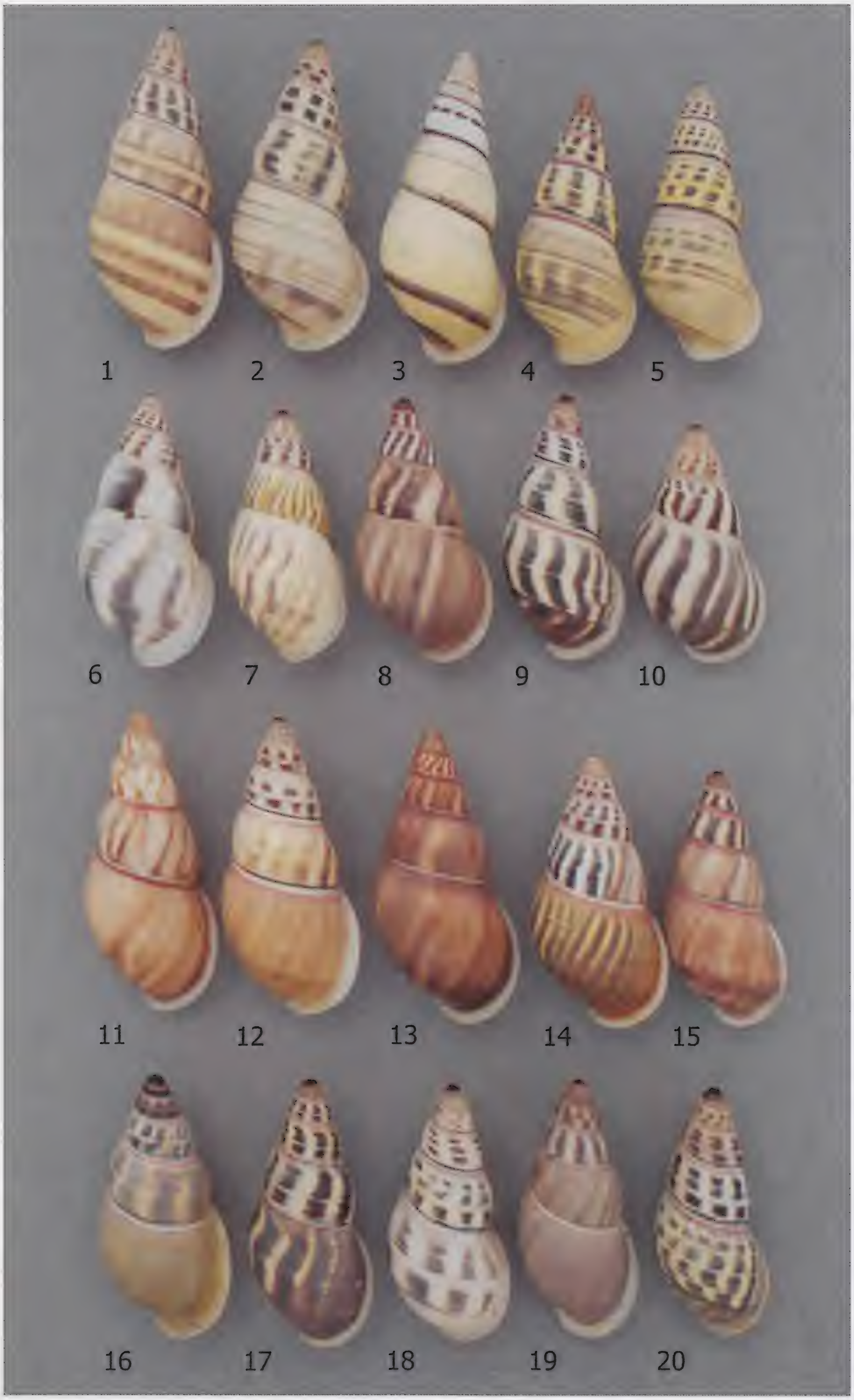


Plate 1. Variation of *A.* (*S.*) *timorensis* n. sp.: **2** holotype, **5** paratype 1, **7** paratype 2, **11** paratype 3 and **18** paratype 4; others are specimen shells (**3** JP; rest JA) [Photo by JA]

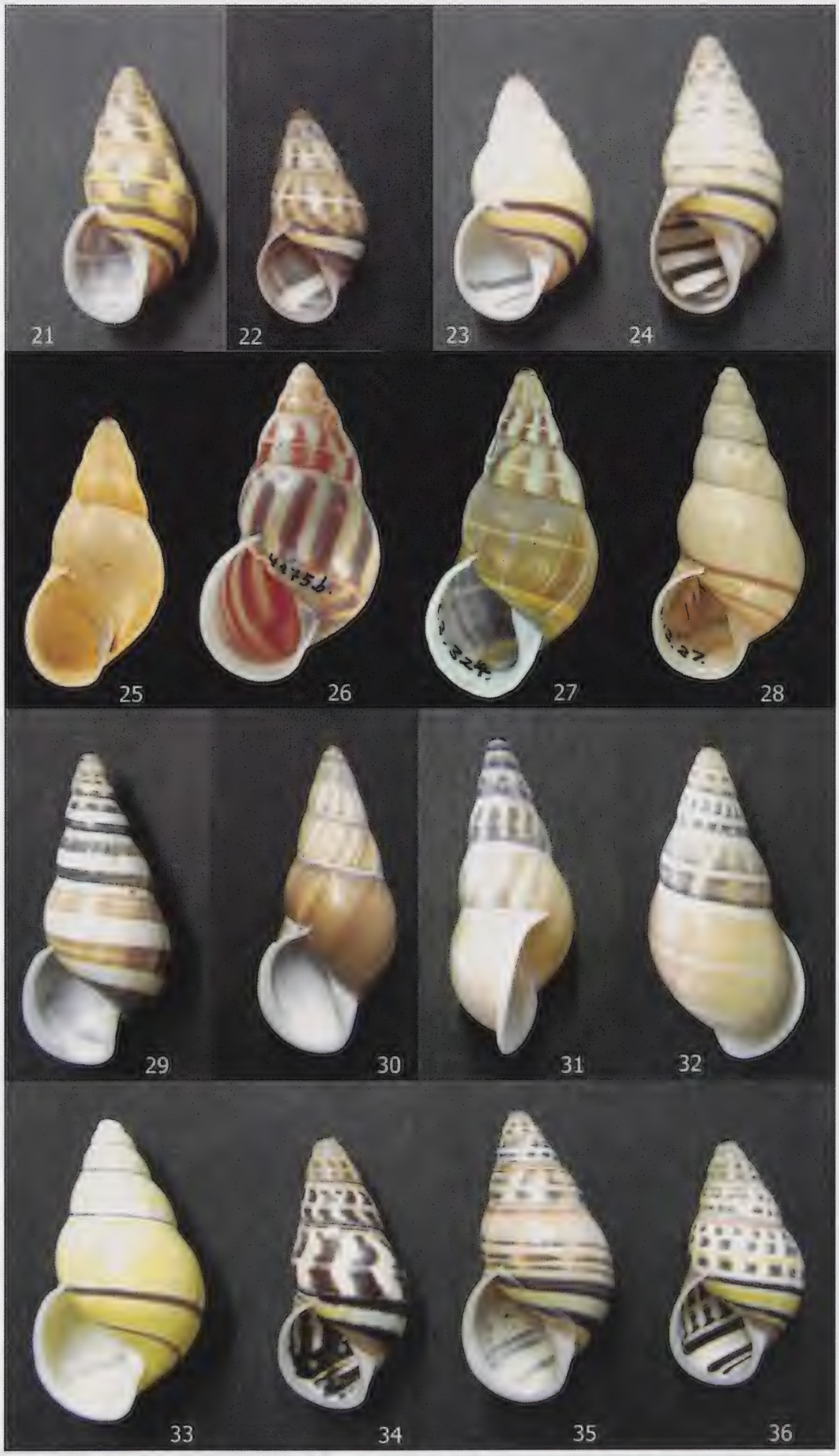


Plate 2. Members of the *A.* (*S.*) *contrarius* group from West Timor, including the nominate subspecies (Shells shown to same scale within each row but not across rows). **First row, figure 21** *A.* (*S.*) *contrarius*, **figure 22** *A.* (*S.*) *con. rolfei*, and **figures 23-24** *A.* (*S.*) *con. suspectus*; **Second row, figure 25** Syntype *A.* (*S.*) *con.* var. *subconcolor* ZMB 5638, **figure 26** Syntype *A.* (*S.*) *con. baaguiae* ZMB 87424, **figure 27** Paralectotype *A.* (*S.*) *con. crassus* NHMUK 1898.12.3.323 and **figure 28** Lectotype *A.* (*S.*) *con. albolabiatus* NHMUK 1896.6.13.27; **Third row, figures 29-30** *A.* (*S.*) *mingmini* and **figures 31-32** *A.* (*S.*) *reuselaarsi*; **Fourth row, figures 33-36** *A.* (*S.*) *rottiensis*. [Image credits: **Figures 21-24 & 29-36** JP; **25** Frank Köhler, 2012a; **26** Frank Köhler, 2012b; **27** Natural History Museum, 2017; **28** Natural History Museum, 2018]

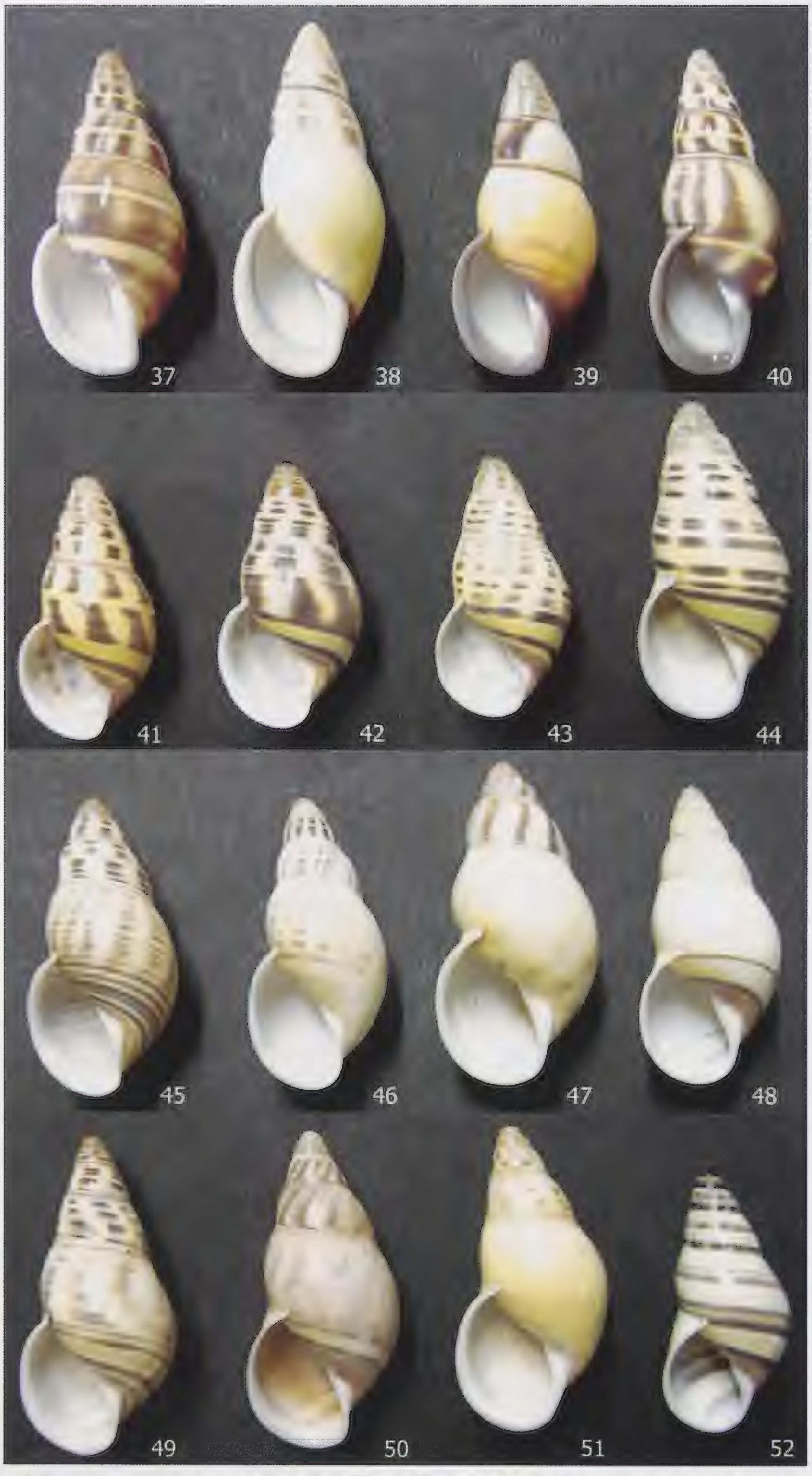


Plate 3. Other members of the *A.* (*S.*) *contrarius* group from West Timor (Shells shown to same scale within each row but not across rows). **First row, figures 37-40** *A.* (*S.*) *con. hanieli*; **Second row 41-44** *A.* (*S.*) *kefaensis* synonym of *A.* (*S.*) *keppensdhondtorum*; **Third row 45-48** *A.* (*S.*) *keppensdhondtorum*; **Fourth row 49-51** *A.* (*S.*) *con. nikiensis*; 52 *A.* (*S.*) *laevus*. [Photos by JP]

ISSN 0738-9388

Volume: 52 THE FESTIVUS ISSUE 3

A new subspecies of the *Eugeniconus nobilis* complex from north-western Sumbawa, Indonesia

Jeff Parsons [1], John Abbas [2] and Steven Lie [3]
[1] 47 Elizabeth Street, Aitkenvale, Queensland, Australia 4814
jeffonese@yahoo.com.au
[2] Lihue, Kauai, Hawaii — Jalan Demaga Baru, Muara Angke, Jakarta Utara Pos 14450, Jakarta, Indonesia john123abba@yahoo.com
[3] Jl. Monginsidi 1 no. 32 Medan, North Sumatera, Indonesia
steven062_2002@yahoo.com

ABSTRACT This paper describes a new member of the *Eugeniconus nobilis* (Linnaeus, 1758) complex from Bungin Island in north-western Sumbawa, Indonesia. It shares some of the features of the subspecies found on geographically separated neighbouring islands and the nominate subspecies. To recognize the distinctness of this new population we name it as a new subspecies in honour of Steven Lie's daughter.

KEY WORDS *Eugeniconus*, *E. nobilis*, *E. n. gisellelieae*, Bungin Island, Sumbawa, Indonesia

INTRODUCTION

Early July of this year, the junior author Steven Lie showed us images of cones shells he acquired from local divers collecting shells off an island in the north-western part of Sumbawa, Indonesia. He sent 5 shells to John Abbas for us to study. At first glance these shells appeared to simply represent a new population of *Eugeniconus nobilis* (Linnaeus, 1758). However, upon closer examination these shells were found to share a mixture of some of the morphological features found in various subspecies in the *E. nobilis* complex, which are geographically separated living on neighbouring islands (see map on Figure 27).

Eugeniconus nobilis skinneri (da Motta, 1982), *E. n. victor* (Broderip, 1842) and *E. n. abbai* (Poppe & Tagaro, 2011) have similar necklace-line patterns, and these patterns all differ from those of the new subspecies, which are more similar to those of the nominate species *E. n. nobilis*. The new subspecies differs from the lectotype of *E. n. nobilis* in having the white macules concentrated into adapical, central and basal zones (or bands) like those of the three subspecies mentioned above, except they sometimes appear in four zones (or bands) in *E. nobilis skinneri*. A comparison and contrast is also made with the other two subspecies, *E. nobilis friedae* (da Motta, 1991) and *E. nobilis renateae* (Cailliez, 1993). Overall the mixture of these morphological features found in this new population show it to be distinctly separable from its neighbours and it is herein described as a new subspecies.

Materials and Methods.

Shells were measured using digital Vernier callipers (0.01 mm resolution), sculpture examined under low magnification (10x) using a jeweler's loupe and via digital images. Whorl count includes the apex and counted precise to 0.125 (⅛ whorl). Relative shell sizes for the genus *Conus* mentioned follow Röckel *et al.*, 1995: small 15-25 mm; moderately small 25-35 mm; medium 35-55 mm; moderately large 55-80 mm; and large >80 mm.

Three shells make up the type series, two paratypes (JP) and the holotype, which will be stored in the MZB and has passed the procedure of deposition. Photography credits appear below the plates. The species description and variation were determined from dry empty shells obtained for Steven Lie by local divers in north-western Sumbawa. Comparative material comprised of shells from primary author's private collection and images of two museum types.

Abbreviations used for museums and private collections:

LSL:	The Linnaean Shell Collection held at the Linnean Society of London, at Burlington House, Piccadilly, Mayfair, London, UK
MHNG	Museum d'Histoire Naturelle, Geneva, Switzerland
MZB	Museum Zoologicum Bogoriense, Bogor, West Java, Indonesia
NBC:	Naturalis Biodiversity Center, Leiden, Netherlands
ZMA.MOL:	NBC specimen label code, ex-Zoölogisch Museum Amsterdam (ZMA)
JA:	John Abbas collection
JP:	Jeff Parsons collection

Abbreviations for shell morphometry, shell coiling and other:

D:	shell width or greatest 'diameter' as per literature usage
H:	shell height or length
H/D:	shell height/shell width ratio
N:	whorl count
JP	comments, data, images, observations or other by Jeff Parsons

Taxonomic remarks

We use the concept of the *Eugeniconus nobilis* complex as accepted by Röckel *et al.*, 1995, except we place all the subspecies in the genus *Eugeniconus* da Motta, 1991, and include another subspecies named after their publication, *E. nobilis abbai* (Poppe & Tagaro, 2011), as well as the new subspecies named herein.

SYSTEMATICS

Family: Conidae Fleming, 1822
Genus: *Eugeniconus* (m.) da Motta, 1991
Type species: *Conus nobilis* (m.) Linnaeus, 1758

Eugeniconus nobilis gisellelieae
Parsons, Abbas and Lie new subspecies
(Plate 1, Figures 1-5 and 7; Plate 2, Figure 12)

Description. (Holotype) Medium-sized obconical shell, solid. Last whorl conical and slightly convex near the carinate shoulder, sides straight below. Spire very low, outline slightly concave and almost flat with a projecting protoconch of about 2 whorls, about 0.55 mm wide. Teleoconch of 9 closely-coiled whorls, adapical whorls have flat sutural ramps and a bead-like border, and later whorls are slightly concave and carinate with about 8 spiral threads crossed by very fine, closely-spaced curved threads. Last whorl decussated with fine collabral and spiral threads; basal third has 8 variably spaced spiral grooves above 10 spiral cords on the base. Protoconch and early teleoconch pink, rest of spire yellowish brown with brown outer borders on later whorls, and superimposed with large white blotches, many subquadrate.

Last whorl yellowish brown, slightly darkened toward the lip and has two zones (or bands) of thin necklace-lines (~ 0.30 mm wide) positioned above and below the midbody, 8 or more in each zone. The necklace-lines are composed of brown lines partially superimposed with evenly-spaced, white rounded or axially aligned rectangular markings. This basal pattern is overlain with white macules concentrated at base, centre and below shoulder; mostly medium-sized (2 to 3 mm), some small (< 1 mm) and others larger (> 4 mm), the latter occur randomly and mostly between the three zones (or bands). White macules are cordate, rounded, subtriangular or irregular, mostly with a brown shadowy border on their apertural side.

Aperture white and narrow, 3.5 mm wide medially and 6.7 mm anteriorly; anal notch moderately deep and 2.69 mm wide, apical outline parabolic. Inner lip almost straight, no pattern loss. Columella white, thickened, short (~ 6 mm long) and hooked at its tip. Outer lip thin and its external edge bordered with dark brown. Base dark red-brown.

Type Material. Three adult shells, all from the type locality. Holotype (MZB. Gst. 21. 784, Plate 1, Figures 2 and 7) H 43.53 mm, D 23.01 mm, H/D 1.89 and N 11. Paratypes (JP) Paratype 1 (Plate 1, Figure 3) H 41.18 mm; and Paratype 2 (Plate 1, Figure 4) H 35.05 mm.

Other Material Examined. Two adult shells from the type locality (JA) specimen 1, H 51.12 mm Plate 1, Figure 1 and Plate 2, Figure 12); and specimen 2, H 38.43 mm (Plate 1, Figure 5).

Type Locality. Bungin Island, Alas, Sumbawa Regency in West Nusa Tenggara, Indonesia.

Distribution. Currently known only from the type locality.

Ecology/Habitat. Collected by local divers on fringing reef around Bungin Island.

External Features of Animal. Unknown.

Soft Parts. Not available for study.

Etymology. Named in honour of Steven Lie's daughter Giselle Natalie Lie.

Shell Variation. The five shells studied (Plate 1), do not show substantial variation between them, indicating a stable gene pool. The columella's tip is hooked in the holotype (Figure 2) and specimen 1 (Figure 1), and straight in the other 3 shells. Ground colour variation occurs as: 1) progressive darkening toward the lip, which is slight in the holotype and distinct in specimen 1; 2) rapidly darkening after a growth stoppage in specimen 2 (Figure 5); or 3) the dorsum is distinctly darker than the ventral side as in paratype 1 (Figure 3). Outer lip with a thin dark brown border as in the holotype, or a narrow dark brown or greyish-brown zone, as in paratype 1, paratype 2 (Figure 4) and specimen 1. The anal notch is deeper in paratypes 1 and 2. The dark shadowy border of the white macules is very distinct on a pale ground, as in the ventral side of paratype 1, and less distinct on a dark ground as in the dorsal side of specimen 1. The spire is very low in four shells and low in specimen 2, which has the early to mid-whorls raised. Periostracum smooth, translucent, pale pinkish buff (yellowish grey) and very thin, similar to that of *E. n. skinneri* (da Motta, 1982).

DISCUSSION

We do not attempt to discuss the following parameters as used by Cailliez, 1993: 1) percentage spire elevation, 2) shell weight to height ratio, and 3) shell angle. Such data comparisons are not useful as it does not show anything outstanding and only proves the general interconnections between each population of the *E. nobilis* complex, thus recognition of each of these geographically isolated populations as subspecies is appropriate. One parameter used by Cailliez, 1993, "the average number of white markings on the spire", was found to be useless since there is a great variability within specimens of *E. nobilis victor* (Broderip, 1842) from Lembata. *E. nobilis gisellelieae* n. ssp. differs from all the other species in that the early spire whorls have flat sutural ramps and a bead-like border and later whorls are slightly concave with a carinate border. A biogeographical map showing the distributions of each of the geographically isolated populations of the *E. nobilis* complex is shown here at Figure 27.

Comparison to Other Populations.

• ***E. nobilis nobilis* (Linnaeus, 1758)** (Plate 1, Figure 6 and Plate 2, Figures 16 and 24)

Accepted Distribution. Seribu Archipelago north of Jakarta, Java (type locality; Finet & Cailliez, 1993); and Sumatra — western coast and islands to the southern tip.

The lectotype (Plate 2, Figures 16) is similar to the new subspecies in sculpture and having white, more or less rounded macules that have a dark shadowy border on their apertural side. It differs in having a narrower shell, pale yellow-brown ground without a gradual or distinct changes its tone, no dark border to the lip, non-browned base and white macules randomly scattered. It also has a weakly carinate shoulder that is less rounded below and spire whorls are progressively flattened. The necklace-lines (Plate 1, Figure 6) are similar, *i.e.* "beaded", but fainter with more white markings.

The modern *E. nobilis nobilis* specimen figured herein (Plate 2, Figure 24) has a similar shaped shell, sculpture and pattern to the lectotype. It differs in having a darker coloured ground and has a brown base like that of the new subspecies, and differs from both in having very faint necklace-lines with very few white markings, *i.e.* appear to be absent. Other pale-coloured specimens seen that are similar to the type shell, differ in having more distinct necklace-lines and a brown base as in the new subspecies.

• ***E. nobilis friedae* da Motta, 1991** (Plate 1, Figure 8 and Plate 2, Figure 15)

Distribution (as per type locality). Dutch Bay Point, northwest of Colombo, Sri Lanka.

The holotype (Plate 2, Figure 15) is similar to the new subspecies in having a sharply carinate shoulder and the white macules concentrated into adapical and basal zones (or bands), but differs in having 2 central zones, *i.e.* 3 zones of brown. Other differences include slightly rounded sides, wider anterior end, a purplish-brown base that tints the columella, weakly carinate shoulder and the spire is not flattened with its height gradually reduced. The white macules differ in being more triangular, often smaller and lack a dark shadowy border. The necklace-lines (Plate 1, Figure 8) differ from those of the other subspecies in being more like a series of numerous very small and closely-spaced white beads, occasionally interspersed with larger ones, and their interspaces are the same colour as the background.

• ***E. nobilis renateae* (Cailliez, 1993)** (Plate 2, Figure 14)

Distribution. Andaman and Nicobar Islands.

The holotype (Plate 2, Figure 14) is similar to *E. n. gisellelieae* n. ssp. in shape, flattened spire with a projecting protoconch and rounded white macules. It differs in having a purplish base with a brown border above, finer sculpture, weakly carinate shoulder and thinner columella. The white macules differ from those of the new subspecies in having a faint shadowy border, being mostly large in size, less numerous and widely scattered, hence more of the orange-brown ground colour showing. The necklace-lines differ in being made of alternating darker brown and white markings that are sparse and highly interrupted, basically absent on the holotype.

• ***E. nobilis skinneri* (da Motta, 1982)** (Plate 1, Figure 9 and Plate 2, Figures 13 and 22)

Distribution. Bali to Sumbawa (including Lombok) and the "Moluccas".

It is a similar to *E. n. gisellelieae* n. ssp. in shape, ground colour, body whorl sculpture and having the white macules concentrated into adapical, central and basal zones (or bands) (Plate 2, Figure 13), except sometimes appearing in 4 zones (Plate 2, Figure 22). It differs from the new subspecies in having a weakly carinate shoulder, coarser spire sculpture, purplish brown base and occasionally has small white axial markings between the white blotches on the spire. White macules differ in being commonly smaller and usually triangular with a paler shadowy border or lacking on some macules. The necklace-lines (Plate 1, Figure 9) differ in being made of axially aligned and variably shaped dark brown markings, usually with white interspaces; more widely-spaced, cover much of the ground below the white macules and on average are wider, although sometimes thin and similar to those in the new subspecies.

• ***E. nobilis victor* (Broderip, 1842)** (Plate 1, Figure 10 and Plate 2, Figures 17-21 and 25-26).

Distribution. Rinca Island; SW Flores — coastal sand bar on the Sumba Strait; E. Flores — north coast (between Maumere and Babi Id.), Larantuka, Babi Id., Permatang Id., Tanjung Bunga and off Baupukan; and NW Lembata.

Low spired specimens are a similar to *E. n. gisellelieae* n. ssp. in shape, body whorl sculpture and shoulder carination. It differs in having a pale to dark brown base, a less flattened spire, coarser transverse spire sculpture, and white, pink or purple early whorls. Ground colour is more variable than in the new subspecies: pale to dark and yellowish-brown (Plate 2, Figures 18-21 and 25-26) or orange-brown (Plate 2, Figure 17). Some shells have a distinct difference between the colour of the ground and necklace-lines (Plate 2, Figures 17, 19 and 25-26), little difference (Plate 2, Figures 18 and 20) and almost no difference with the necklace-lines appearing absent (Plate 2, Figure 21). Other shells have very few small tents and pale to dark necklace-lines (Plate 2, Figures 20 and 19 respectively).

E. nobilis victor is also similar to the new subspecies in having the white macules concentrated into adapical, central and basal zones (or bands), and some shells may have slightly or distinctly darkened border to a previous lip. White macules are often similar in shape, but may also be rhomboid or diamond-shaped, and tend to have a brown shadowy border only when present on top of the necklace-lines, rarely more widely present. The necklace-lines (Plate 1, Figure 10) are different in being similar to those of *E. nobilis skinneri*, except closely-spaced, often wider, more numerous, pale to very dark in colour and usually lack white interspaces.

- ***E. nobilis abbai*** **(Poppe & Tagaro, 2011)** (Plate 1, Figure 11 and Plate 2, Figure 23).

Distribution (as per type locality). Solor Island.

The figured shell (paratype 4, JA; Plate 2, Figure 23) appears more yellowish in the figure than it is in reality due to type of lighting used during photography. This subspecies is similar to *E. n. gisellelieae* n. ssp. in shape, low spire, body whorl sculpture, dark-bordered carinate shoulder and having the white macules concentrated into adapical, central and basal zones (or bands). It differs from the new subspecies in having a dark brown or purple base, white or pink protoconch that projects more, tapered columella and slightly coarser transverse spire sculpture. The white macules differ in being smaller with very small ones present on the zones, sometimes rhomboid or diamond-shaped and lack a dark shadowy border. The necklace-lines (Plate 1, Figure 11) are different in being composed of thin brown markings with or without white interspaces, like those of *E. nobilis victor*, except thinner, more numerous and typically slightly darker than the ground.

ACKNOWLEDGMENTS

We thank the local divers for sending the type specimens of this new species to John Abbas and Steven Lie. We also give thanks to Dr. rer. nat. Ayu S. Nurinsiyah, and the following staff of the Research Center for Biology-LIPI at MZB for their assistance in depositing the holotype: Dr. Cahyo Rahmadi, (Director), Ir. Ristiyanti Marwoto M.Sc. (Head of Malacology Department) and their associates at the Laboratory of Malacology.

LITERATURE CITED

Cailliez, J.-C. 1993. 'The *Conus nobilis* Group in the Sunda Islands (French & English).' Xenophora 63:6-26, 25 figs, 1 map.

da Motta, A.J. 1991. 'A new genus and a new species (Gastropoda: Conidae).' *La* Conchiglia 22(258):12-15.

Finet, Y. & Cailliez, J.-C. 1993. 'The type of *Conus nobilis* Linnaeus, 1758: a specimen from Java.' La Conchiglia 25(266):18-28.

Google Maps, 2020. 'Eastern Indian Ocean and Indonesia,' Greyed version of typical format, made available at: https://www.thenostomaniac.com/sojourner/2018/9/9/26-island-cruise-sumbawa-indonesia [Accessed: 22 July 2020]

Kohn, A.J. 2014a. '*Conus* (*E.*) *nobilis friedae*,' Image: MHNG 10710. The Conus Biodiversity Website. [Retrieved: 30 June 2014] <http://biology.burke.washington.edu/conus/gallery/img/friedaeDaMotta_MHNGhtype1>

Kohn, A.J. 2014b. '*Conus* (*E.*) *nobilis renateae*,' Image: ZMA.MOLL.137045. The Conus Biodiversity Website. [Retrieved: 30 June 2014] <http://biology.burke.washington.edu/conus/gallery/img/renateaeCaillez_ZMAtype1.jpg>

Kohn, A.J. 2014c. '*Conus* (*E.*) *nobilis nobilis*,' Image: LSL 301. The Conus Biodiversity Website. [Retrieved: 30 June 2014] <http://biology.burke.washington.edu/conus/gallery/img/nobilisLinne_LSLtype2.jpg>

Poppe G.T. & Tagaro S.P. 2011. 'A new subspecies of *Conus nobilis* Linnaeus, 1758 from Solor Island, Indonesia.' Visaya 3(3):83-90.

Röckel D., W. Korn and A.J. Kohn. 1995. 'Manual of the living Conidae.' Volume 1: Indo-Pacific Region. Verlag Christa Hemmen: Wiesbaden, Germany: 517 pp, 84 pls.

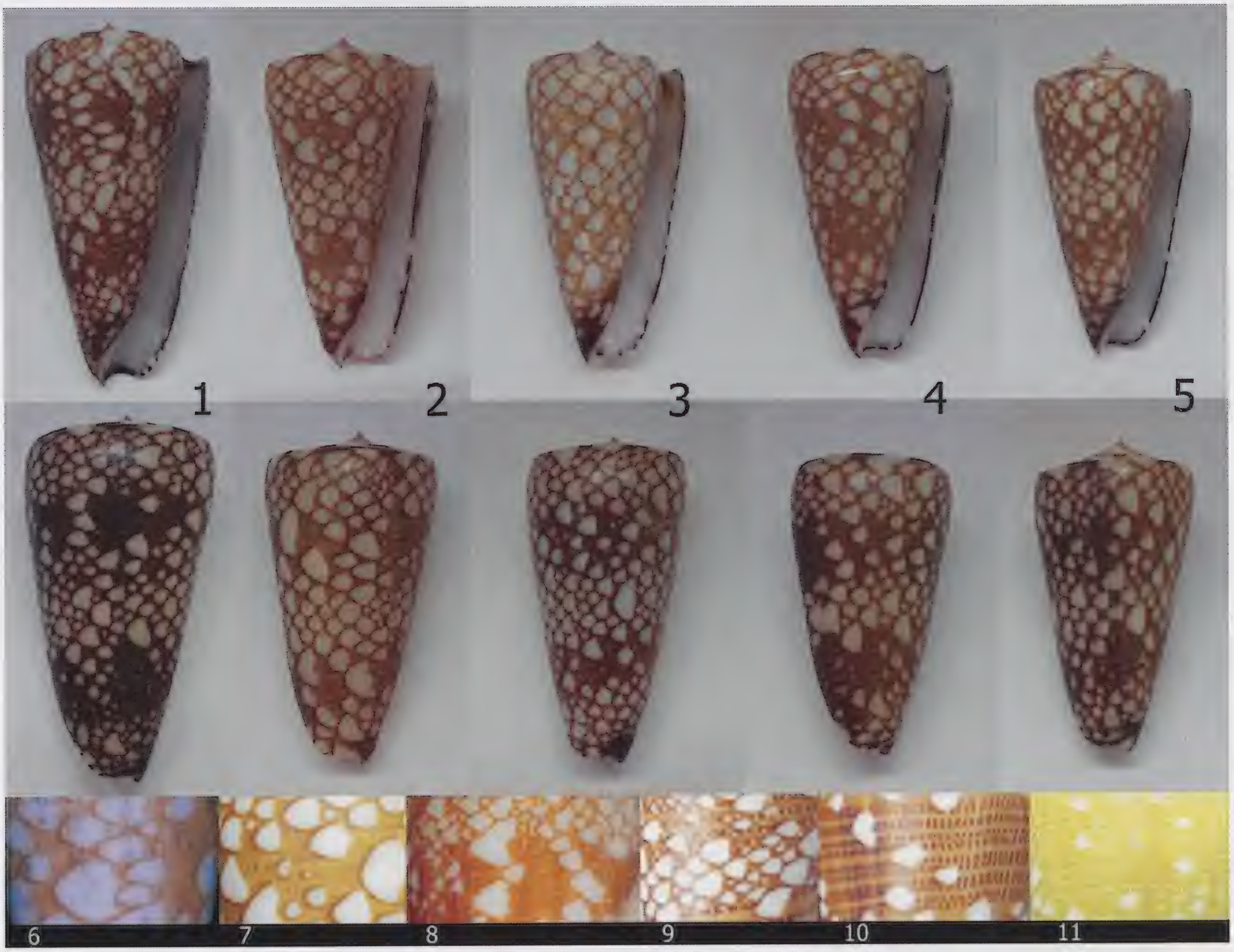


Plate 1. Variation of *Eugeniconus nobilis gisellelieae* n. ssp. and a comparison of the necklace-lines of 6 subspecies: **First & second rows, Figures 1-5**, 1 specimen 1, 2 holotype, 3 paratype 1, 4 paratype 2 and 5 specimen 2 (paratypes and specimens, JA); **Third row, Figure 6** *E. nobilis nobilis* lectotype; **Figure 7** *E. nobilis gisellelieae* n. ssp. holotype; **Figure 8** *E. nobilis friedae* Holotype; **Figure 9** *E. nobilis skinneri* Bali (JP); **Figure 10** *E. nobilis victor* NW Lembata (JP); **Figure 11** *E. nobilis abbai* paratype 4. [Image credits: 1-5, & 7 JA; 6, & 8-11 cropped (JP) from images seen in plate 2, see that for credits].

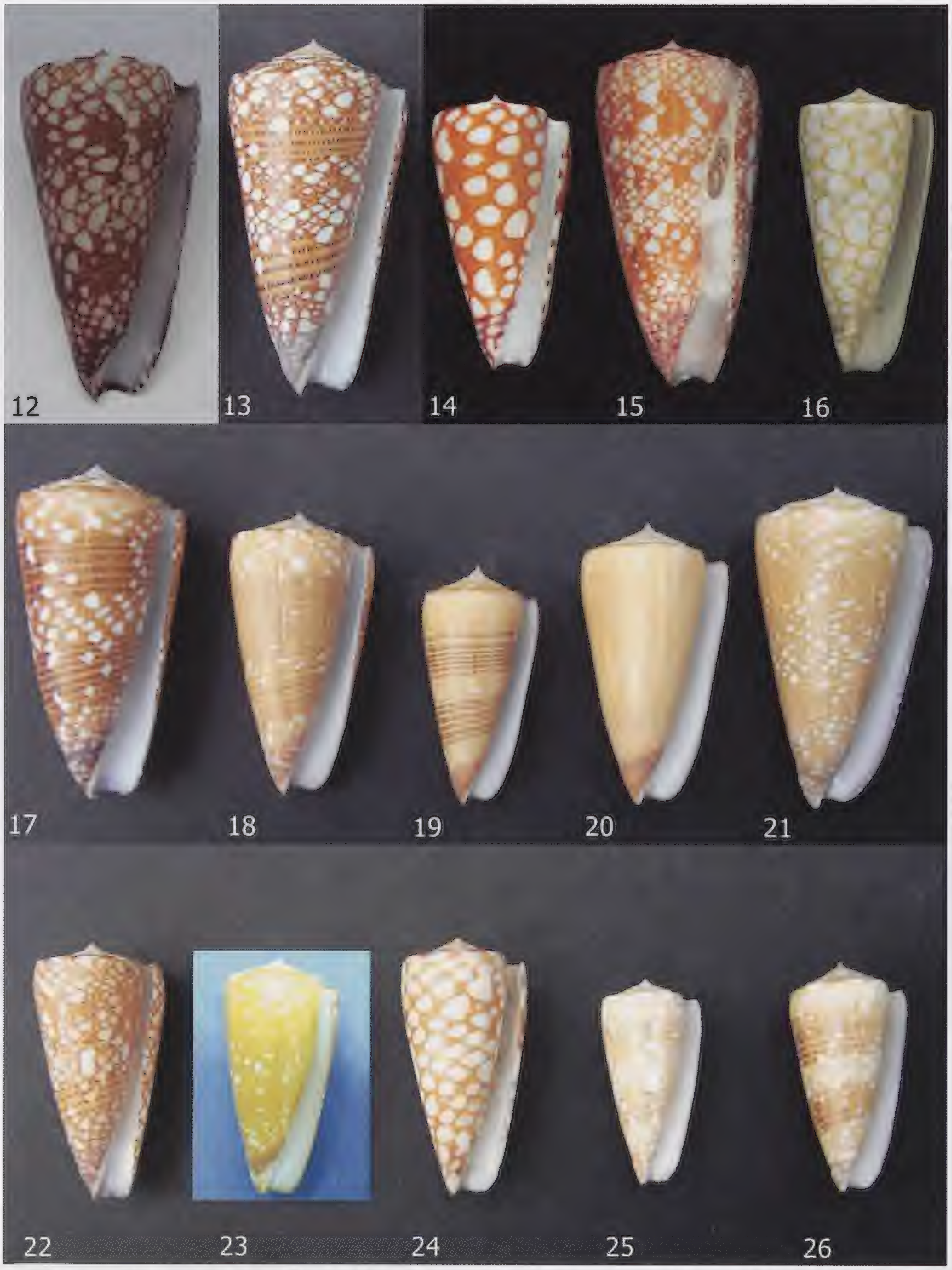


Plate 2: Comparison and contrast of *E. nobilis gisellelieae* n. ssp. with other members of the *E. nobilis* complex. **First row, Figure 12** *E. nobilis gisellelieae* n. ssp.; **Figure 13** *E. nobilis skinneri* Bali (JP); **Figure 14** *E. nobilis renateae* Holotype, Andaman Islands; **Figure 15** *E. nobilis friedae* Holotype, northwest of Colombo, Sri Lanka; and **Figure 16** *E. nobilis nobilis* lectotype; **Second row, Figures 17-21** *E. nobilis victor* NW Lembata (JP); **Third row, Figure 22** *E. nobilis skinneri* Lombok; **Figure 23** *E. nobilis abbai* paratype 4, Solor; **Figure 24** *E. nobilis nobilis* Sri Lanka (JP); **Figures 25-26** *E. nobilis victor* (JP): **25** SW Flores, Sumba Strait and **26** Permatang Island, E. Flores. [Image credits: 12 JA; 13 JP; 14 Kohn, 2014a; 15 Kohn, 2014b; 16 Kohn, 2014c; 17-26 JP].

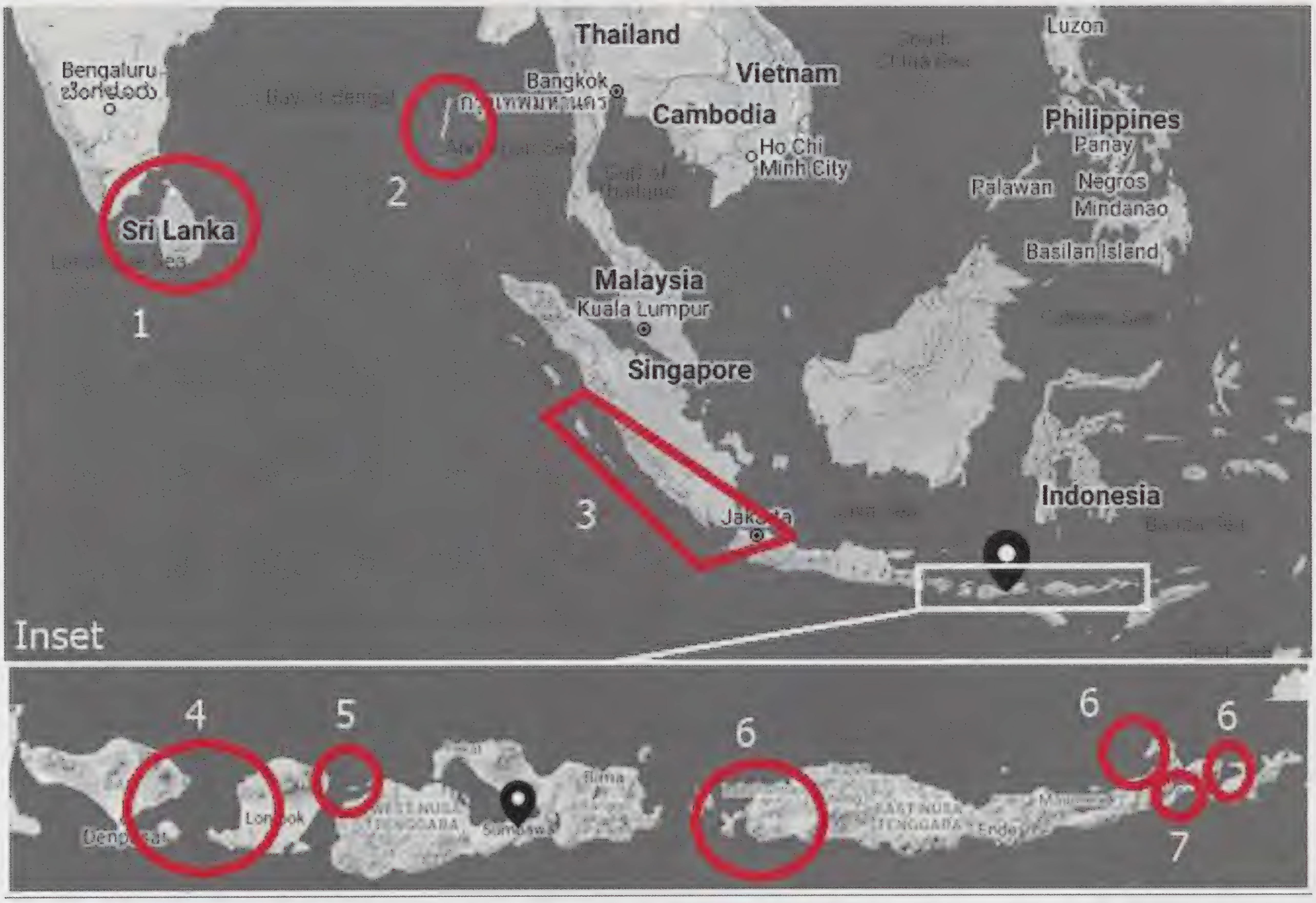
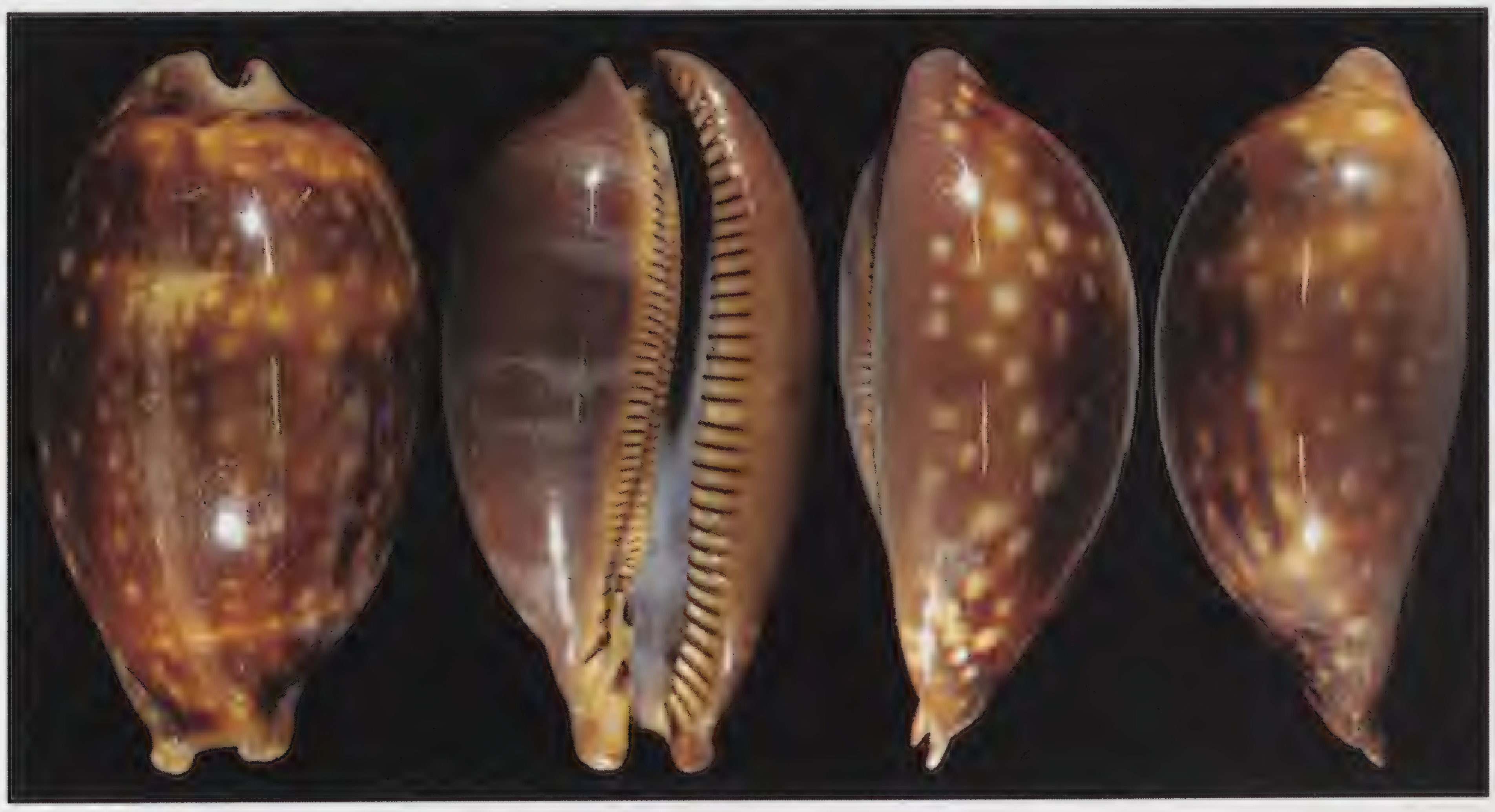


Figure 27. Distribution of all members of the *Eugeniconus nobilis* complex. The following numbers appear next to red circles or other shape on the above map: **1.** *E. nobilis friedae*; **2.** *E. nobilis renateae*; **3.** *E. nobilis nobilis*; **4.** *E. nobilis skinneri*; **5.** *E. nobilis gisellelieae* n. ssp.; **6.** *E. nobilis victor*; and **7.** *E. nobilis abbai*. [adapted from Google Maps, 2020].

Taxonomic Note: *Macrocypraea mammoth* Simone & Cavallari, 2020. A new cowrie species from Trindade, a remote oceanic island off Espírito Santo, Brazil. Reillustrated here is the holotype: 133.1 mm by 54.6 mm by 72.4 mm; MZSP 108077.



Quote from abstract: "The new species can be distinguished from other Western Atlantic species by its larger size, proportionally heavier and more solid shell, more rounded and wider outline, longer posterior tapered ending and slightly inflated base."

Simone L.R.L., & D.C. Cavallari. 2020. A new species of *Macrocypraea* (Gastropoda, Cypraeidae) from Trindade Island, Brazil, including phenotypic differentiation from remaining congeneric species. PLoS ONE 15(1): e0225963.

ISSN 0738-9388

Have a shell collection you would like to donate to The San Diego Shell Club?

The San Diego Shell Club is interested in your shell collection. As a 501c(3) organization, all donations to our Club may provide a tax write-off. When we receive a donation we provide a letter describing the items that may be used when filing your taxes. While we cannot provide a value, donations of up to $5,000 do not require a written appraisal. Since tax laws change regularly we recommend that you check with your tax accountant before relying on any information provided here.

We are interested in all types of shells, marine or land and all genera and species, including books on shells as well as items related to shells such as artwork, storage cases and tools. Your donated items will be used to generate income to support the Club's efforts in continuing Public education about shells and conservation of marine life throughout the world. If you would like to donate, please contact David Waller, SDSC Acquisition Chairperson, at dwaller@dbwipmg.com to schedule a time to discuss charitable gifting.

CLUB NEWS

2020 May General Meeting

Canceled due to the COVID19 pandemic.

2020 June - San Diego County Fair

Canceled due to the COVID19 pandemic.

2020 July General Meeting

Canceled due to the COVID19 pandemic.

ISSN 0738-9388

Editor's Corner - What is with all those "new species"?

David P. Berschauer, Editor
shellcollection@hotmail.com

One of the things that has been a controversial topic in malacology for many years now is the "so-called" proliferation of names of "new species" in the literature. Since our journal began publishing "new taxa" articles in 2014 at the behest of James McLean, Daniel Geiger, and others, we have been faced with this issue. Certainly these "new species" did not appear all at once magically out of thin air, but the animals that are the subject of the new names have recently been "found" or "discovered" by someone. This has been happening for hundreds of years since binomial nomenclature was established in 1758.

Without getting into extensive philosophical discussions about species concepts (of which there are presently more than twenty working definitions), what we refer to as a "species" can be more simplistically called "kinds." All "kinds" need a name in order to intelligently discuss them. What "kind" of creature do you mean to refer to? This is often extremely important when we look at biodiversity studies, the effects of climate change, extinction, and mankind's impact on the environment; *i.e.* the "canary in the coal mine" effect. What we see and learn when we really explore nature is that there is still so much to be explored and discovered out there. One of the byproducts of such exploration is finding "new" creatures (at least new to us) that we did not know about before. The scientists and "citizen scientists" who describe these unknown "kinds" are the ones who have created this apparent proliferation of "new species." Look and you will see; seek and you will find.

So when you discover something different than what you have seen before, how do you know that it may be a "new" taxon? First you have to have a fairly thorough understanding of the other similar creatures that exist. Second, you need to look at traits or characters of the animal in question and compare those traits or characters to other known creatures. What traits or characters are important? For hundreds of years morphology has been the major tool in systematics - shape, form, and function. With increases in technology scientists began to look to anatomy, physiology, and biochemistry to help better understand the creatures they studied. In the early 1980s, the Scanning Electron Microscope ("SEM") provided us with yet another tool to help study and understand organisms; this led to a massive number of research studies using SEMs looking microscopically at certain characters. In recent decades the newest technology, the use of mitochondrial DNA studies, has practically taken over the science of systematics; whether these biochemical characters code for any identifiable trait or character in the organism is a yet unanswered question. With extinct organisms (*i.e.* fossils) we are, for the most part, precluded from using biochemical analysis and have to focus on readily observable characters or traits in the organism's fossil remains. Once again, one has to question whether the characters or traits that are being observed are relevant to the issue of what "kind" of organism we are studying.

When we observe what we believe to be a species what we are really looking at is an individual organism - in technical terms a semaphoront. We can observe the properties, characters or traits of that individual, and others, and we can infer from what we observe that this is a "kind" - an organism that belongs to a larger group or population of similar organisms. This is a species hypothesis. We need to keep in mind that we are dealing with a living animal in a four dimensional space-time environment. That species hypothesis is made through study and observation, and when published that new species name "accompanied by a description or definition that states in words characters that are purported to differentiate the taxon," is a "new species" description. Needless to say those types of organisms that get the most attention (due to perceived economic value, beauty or popularity) tend to have the most discoveries of "new taxa." Not surprisingly even geographic areas that have been explored for hundreds of years can and do yield amazing new discoveries; case in point, *Zacatrophon goliath* Houart & Löser, 2020, which was recently discovered in the Sea of Cortez (back cover).

ISSN 0738-9388

Smaller California Record Size Shells

Roger A. Evans
3120 Sepulveda Blvd., Unit 214, Torrance, California 90505
c/o elise.d.evans@gmail.com

The Conchological Club of Southern California, formed in 1902, maintained a list of record size shells from about 1950 to 1987. Shells collected anywhere were originally included but, “as problems arose,” the list was limited to marine shells of the Eastern Pacific from Alaska to Chile. Eventually the list was titled the List of Champions of the Lost Operculum Club (LOC). Bertram C. Draper (1904 – 2000), a Museum Associate at the Natural History Museum of Los Angeles County (LACM) and a small shell specialist, was Chairman of the LOC from 1966 to 1987. Bert believed there was more to a record shell than its size. LOC listings often provided a specific location of collection and an effort was made to list the collector and/or previous owner. If a specimen was acquired from a dealer, that too was noted. The records had a continuity and the listings provided a Who’s Who and history of shelling. Bert viewed and measured most of the records himself and wouldn’t usually accept a new species listing unless the specimen measured near the upper size range recorded in reference books. He wanted creditable records; not stand-ins. LOC records were broken the old-fashioned way – by larger specimens. If a new shell was 0.1 mm or even 0.05 mm larger, the existing record was replaced. The final 1987 LOC edition, with the vast majority of its listings collected off Mexico, was the culmination of four decades of *bona fide* effort to document record size shells.

The LOC records and World Size Records of Wagner and Abbott were generally incorporated into the 1997 Registry of World Record Size Shells (WRS) initiated by Kim and Linda Hutsell and Donald Pisor. LOC records 25 mm or larger had previously been accepted by Wagner and Abbott. The WRS rules were similar to those of the LOC except the WRS shell size was determined by the greatest measurable dimension of a specimen. Some LOC records measured along an axis could have a larger measurable size under WRS rules. The WRS also accepted Wagner and Abbott’s generous record protection by requiring a new entry to exceed the current record by a minimum of 0.3 mm, unless the shell had a normal adult size of 10 mm or less. The difference of 0.3 mm is significant for specimens up to at least 50 mm, if not more. LOC records weren’t protected; the larger shell wore the crown. The world focus of the WRS limited the data provided, but the records were reasonably managed through the 2008 edition.

In 2008, control of the WRS passed to new hands far from California. Rather than grandfather older established records, a new rule allowed for unphotographed listings, such as those from the LOC, to be replaced by smaller photographed specimens, assuming that photos verified proper identification and measurement. The new photo rule effectively encouraged those seeking records to target older unphotographed listings. What had been a collecting challenge became a photo contest. Predictably, a startling number of former LOC listings have been replaced by smaller shells through 2016 and that process continues. In the LOC days, it never occurred to anyone to submit a specimen that was smaller than the current record. The WRS rules and gatekeepers are significant determinants of record quality. Do the photographed replacement listings have creditable size? Do the thousands of new species listings meet minimum size standards or is any submitted photographed shell accepted as the newly listed species record? Collector participation is another determinant of record quality. Costly WRS printed editions and website access fees likely reduce participation. Without active collector competition the records may lack credibility. The entity Havelet Marine held 13,494 WRS listings in 2016, almost 65% of the total listings. Such dominance raises questions, including who or what does Havelet Marine represent and how and where were all those shells acquired? The 2018 WRS edition, with an initial price of about $200 and 22,604 listings, is said to be the last print edition.

The following list, with exceptions, provides the history of some former LOC records that have been replaced by smaller WRS listings, limited to species found off California. Many more former LOC records collected off California and elsewhere, have suffered a similar fate. Since the 2018 WRS edition was expensive and the website charges fees, the listings in the 2016 WRS edition, purchased for $24, will be used for comparison.

1. ***Bulla gouldiana*** Pilsbry, 1895. The 1980 LOC through at least 2008 WRS record was 73.5 mm, collected Morro Bay, CA, 1961, held by the notable Eugene Coan. The 2016 WRS listing was 54.18 mm.
2. ***Calliostoma annulatum*** (Lightfoot, 1786). The 1987 LOC record was 40.8 mm, collected Pacific Grove, CA, 1935, held by E.W. Ulrich. In November 1976, I viewed the fine collection and impressive *annulatum* of Mr. Ulrich, a gracious gentleman, at his home in Long Beach, CA. An unconfirmed Earl William Ulrich (1895 – 1978) of Long Beach, passed in October 1978. The 1997 through 2001 WRS record was 40.8 mm, collected 1935, apparently the Ulrich specimen, now held by W.D. Schroeder. The 2005 through at least 2008 WRS record was 41.7 mm, held by W.D. Schroeder, also collected 1935. The remeasured Ulrich shell? The WRS doesn't record previous owners so it's difficult to follow a specimen. The 1987 LOC edition was delayed to include about 300 new records held by Walter D. Schroeder, acquired from the recently purchased collections of Helen and Michael O'Brien and the Louis B. Mousley collection not in the Mousley Museum of Yucaipa, CA. Bert Draper rechecked the identification and measurement of all these new records and recorded their previous owners in the LOC listings. It appears that Walter continued to purchase collections. The 2016 WRS *annulatum* listing was 37 mm.
3. ***Calliostoma supragranosum*** Carpenter, 1864. The 1980 LOC through at least 2008 WRS record was 14 mm, collected Palos Verdes, CA, 1977, by Kevin May. I've measured Kevin's record specimen; my largest is 13.5 mm. The 2016 WRS listing was 13.13 mm.
4. ***Calliostoma tricolor*** Gabb, 1865. The 1980 LOC through at least 2008 WRS record was 22.3 mm from the Ball collection, collected San Pedro, CA, no date, held by the Natural History Museum of Los Angeles County (LACM). My largest *tricolor* is 20 mm, followed by three at 19.7. The 2016 WRS listing was 18.75 mm.
5. ***Cancellaria cooperii*** Gabb, 1865. The 1987 LOC through at least 2008 WRS record was 112 mm, collected Palos Verdes, CA, 1983, held by Pat Pyuitt. My 1980 LOC record is 97.2 mm, and Kevin May has one near 100 mm. The 2016 WRS listing was 88.96 mm.

6. ***Cancellaria crawfordiana*** (Dall, 1891). The 1987 LOC record was 53 mm, collected at a depth of 200 meters off Trinidad, CA, 1968, held by Bob Talmadge. Robert Talmadge (1913 – 1979) of Eureka, CA, wrote many papers for *The Veliger* and had an interest in deep water mollusks. The 1997 through at least 2008 WRS record was the Talmadge specimen, now held by the Redwoods Museum. The 2016 WRS listing was 47.5 mm.
7. ***Californiconus californicus*** (Reeve, 1844). The 1980 LOC through at least 2008 WRS record was 49 mm, collected Morro Bay, CA, held by Morris Carruthers. Morris was recorded deceased in the 1987 LOC where he had ten listings, all with a date of March 1950. It's unlikely all ten were collected at that time. The date may indicate when the records were registered with the LOC and if so, they would represent original 1950 listings, collected at an earlier date. The 2016 WRS listing was 45.55 mm.
8. ***Crassispira semiinflata*** Grant and Gale, 1931. The 1980 LOC through at least 2008 WRS record was 58.8 mm, collected Palos Verdes, CA, 1977, by Roger Evans. I have seven over 54 mm. The 2016 WRS listing was 43.9 mm.
9. ***Crepidula norrisiarum*** Williamson, 1905. The 1980 LOC through at least 2008 WRS record was 40.8 mm, collected N. of Goleta, CA, 1969, held by Jean Wilkins (1910 – 1971). Jean's collection is held by the Santa Barbara Museum of Natural History (SBMNH). My largest is 40 mm. The 2016 WRS listing was 8.95 mm.
10. ***Crepidula onyx*** Sowerby 1824. The 1980 LOC through at least 2008 WRS record was 71.5 mm, collected San Pedro, CA, 1979, by Roger Evans. I have eight over 61 mm. The 2016 WRS listing was 43 mm.
11. ***Dentalium neohexagonum*** Pilsbry and Sharp, 1897. The 1980 LOC through 1997 WRS record was 47.9 mm, collected Palos Verdes, CA, 1979, by Roger Evans. The 1999 through at least 2008 WRS record was 48.6 mm, collected in Canada in 1922, held by the Academy of Natural Sciences Museum, Philadelphia, PA. The 2016 WRS listing was 22.95 mm.
12. ***Epitonium bellastriatum*** Carpenter, 1864. The 1980 LOC through at least 2008 WRS record was 23 mm, collected Santa Monica, CA, 1917, by E.P. Chace and held by Helen DuShane. Emery Chace (1882 – 1980) was curator of Mollusca at the San Diego Society of Natural History, 1954 – 1967, and a prolific collector. Helen DuShane (1907 – 2002) wrote *The Family Epitoniidae in the Northeastern Pacific – The Veliger*, 22(2), still the bible on the subject over 40 years later. Her epitoniid collection is held by the SBMNH. Paul Stillians has a 21.6 mm *bellastriatum*; my largest is 21.3 mm. The 2016 WRS listing was 17.66 mm.
13. ***Forreria belcheri*** (Hinds, 1843). The 1980 LOC through at least 2008 WRS record was 187 mm, collected Zuma Beach, CA, 1971, from Dr. Rimmon Fay and held by Pat Brophy. Pat was a Collections Assistant at the SBMNH. *Addisonia brophyi* J.H. McLean, 1985, collected off Gaviota, CA, was named after Pat – *The Veliger*, 28(1). The 2016 WRS *belcheri* listing was 160.3 mm.
14. ***Hespererato vitellina*** (Hinds, 1844). The 1987 LOC through at least 2008 WRS record was 17.1 mm, collected Monterey, CA, 1980, by Roger Evans. The 2016 WRS listing was 15.83 mm.
15. ***Kelletia kelletii*** (Forbes, 1850). The 1980 LOC through at least 2008 WRS record was 171.4 mm, collected Redondo Beach, CA, in a fish trap, no date, held by Rose Burch (1897 – 1989). Rose and her husband, the prominent John Q. Burch (1894 – 1974), collected as a family and

were noted for the many fine specimens they collected/dredged off Redondo Beach. John initiated the LOC. The 2016 WRS listing was 165.28 mm.

16. ***Leukoma laciniata*** (Carpenter, 1864). The 1980 LOC through at least 2008 WRS record was 95.4 mm (I measure 96.7), collected Redondo Beach, CA, 1975, by Roger Evans. The 2016 WRS listing was 86.54 mm.
17. ***Leukoma staminea*** (Conrad, 1837). The 1980 LOC through at least 2008 WRS record was 82 mm, collected Alamitos Bay, CA, 1970, held by Ralph Ferguson. Ralph (1931 – 2016), friendly and informal, was an enthusiastic collector and shell dealer with a store in Wilmington, CA. The 2016 WRS listing was 55.69 mm.
18. ***Lithophaga plumula*** (Hanley, 1843). The 1980 LOC through at least 2008 WRS record was 72.5 mm, collected Palos Verdes, CA, 1979, by Roger Evans. The 2016 WRS listing was 38.75 mm.
19. ***Maxwellia gemma*** (Sowerby, 1879). The 1987 LOC record was 45.5 mm, collected dead on a beach, Laguna Beach, CA, 1965, held by the notable Helen DuShane. The 1997 through at least 2008 WRS record was also 45.5 mm, collected 1965, apparently the DuShane specimen, now held by the American Museum of Natural History, New York. The 2016 WRS listing was 41.5 mm.
20. ***Maxwellia santarosana*** (Dall, 1905). The 1980 LOC through at least 2008 WRS record was 48.9 mm, collected San Diego, CA, 1976, held by C.A. and C.L. Martin. Clifford A. (1910 – 1992) and Clifton L. Martin (1910 – 1996), twin brothers, were members of the San Diego Shell Club and had seven 1987 LOC records. My largest *santarosana* is 45 mm. The 2016 WRS listing was 44.39 mm.
21. ***Mytilus californianus*** Conrad, 1837. The 1987 LOC record was 251 mm, collected Johnston Seamount, Baja CA, 1972, held by Gordon Chan. Gordon wrote a 1973 paper on this record in *The Veliger*, 16(2). The 1997 through at least 2008 WRS record was 258 mm, collected CA, 1992, held by Paul Patchick. Paul wrote articles on rarity for *Shells and Sea Life*, February 1987, and *Hawaiian Shell News*, May 1987. The 2016 WRS listing was 233.16 mm.
22. ***Nassarius perpinguis*** (Hinds, 1844). The 1987 LOC through at least 2008 WRS record was 25.9 mm, collected Redondo Beach, CA, 1982, by Roger Evans. The 2016 WRS listing was 14.03 mm. I have 92, all collected dead, larger than 14 mm.
23. ***Neobernaya spadicea*** (Swainson, 1823). The 1987 LOC record was 67.6 mm, collected Long Beach breakwater, 1960, held by E.W. Ulrich. I've seen this remarkable specimen. The 1997 through at least 2008 WRS record was 81 mm, collected 1959, held by Hazel Wood. What became of this astonishing spadicea? The 2016 WRS listing was 67.9 mm. The remeasured Ulrich specimen?
24. ***Neverita lewisii*** (Gould, 1847). The 1980 LOC through at least 2008 WRS record was 166.3 mm, collected Santa Monica Bay, CA, no date, by the notable Emery P. Chace. The 2016 WRS listing was 126.72 mm.
25. ***Ocinebrina circumtexta*** (Stearns, 1871). The 1980 LOC and perhaps an original 1950 listing, through at least 2008 WRS record was 35 mm, collected Cayucos, CA, held by Morris Carruthers (see #7). The 2016 WRS listing, as *Urosalpinx c.*, was 26.03 mm.
26. ***Olivella baetica*** Carpenter, 1864. The 1980 LOC through at least 2008 WRS record was 22.2 mm, collected Torrance Beach, CA, 1976, by Roger Evans. I also have 20.5 and 21.5 mm specimens. The 2016 WRS listing was 14.48 mm.

27. ***Opalia funiculata*** (Carpenter, 1857). The 1980 LOC through at least 2008 WRS record was 22.6 mm, collected Palos Verdes, CA, 1976, by Roger Evans. The 2016 WRS listing was 16.5 mm.
28. ***Ophiodermella inermis*** (Reeve, 1843). The 1980 LOC through 2001 WRS record was 44 mm, collected Redondo Beach, CA, 1980, by Roger Evans. The 2005 through at least 2008 WRS record was 45.6 mm, collected San Diego, CA, 1940, held by W.D. Schroeder. The 2016 WRS listing was 32.4 mm.
29. ***Parapholas californica*** (Conrad, 1837). The 1980 LOC through at least 2008 WRS record was 158.6 mm, collected Monterey, CA, 1979, by Roger Evans. The 2016 WRS listing was 139.24 mm.
30. ***Pseudopusula californiana*** (Gray, 1827). The 1987 LOC through at least 2008 WRS record was 12.5 mm, collected Palos Verdes, CA, 1980, by Roger Evans. I have the 12.4 mm 1980 LOC record and a recently measured 12.7 mm specimen. The 2016 WRS listing was 11.53 mm.
31. ***Pteropurpura vokesae*** Emerson, 1964. The 1980 LOC through at least 2008 WRS record was 68.3 mm, with no data from E.P. Chace, held by the notable Twila Bratcher. Twila (1911 – 2006) was a LACM Malacology Research Associate and co-author of *Living Terebras of the World*, 1987. The 2016 WRS listing was 57.08 mm.
32. ***Pusula solandri*** (Gray in Sowerby, 1832). The 1987 LOC through at least 2008 WRS record was 24 mm, collected Punta Pequena, Baja CA, 1971, held by the LACM. My largest is 20.85 mm. The 2016 WRS listing was 19.8 mm.
33. ***Sinum scopulosum*** (Conrad, 1849). The 1980 LOC, and perhaps an original 1950 listing, through 2001 WRS record was 45 mm, collected Newport Bay, CA, held by Morris Carruthers. The 2005 through at least 2008 WRS record was 45.9 mm, collected Newport Beach, CA, 1937, held by W.D. Schroeder. The remeasured Carruthers shell? The 2016 WRS listing was 43.3 mm.
34. ***Tegula funebralis*** (A. Adams, 1855). The 1980 LOC through at least 2008 WRS record was 56 mm, collected Marin Co, CA, 1974, held by Gordon Chan. I believe Gordon taught at the College of Marin and *Hallaxa chani*, collected Marin Co, 1975, was named after him – *The Veliger*, 17(4). The 2016 WRS listing was 35.12 mm.
35. ***Tivela stultorum*** (Mawe, 1823). The 1980 LOC through at least 2008 WRS record was 176 mm, collected Pismo Beach, CA, 1950, held by the notable John E. Fitch. John (1918 – 1982) was a Research Director at the California Dept. of Fish and Game, where he wrote *Common Marine Bivalves of California*, 1953, and at least six booklets/papers on the Pismo clam, 1950 – 1965. John was a noted authority on the Pismo, who sought to protect the clam from over-fishing. He couldn't protect his LOC record. The 2016 WRS listing was 135.3 mm.
36. ***Urosalpinx subangulata*** (Stearns, 1973). The 1980 LOC through at least 2008 WRS record was 19.65 mm, collected Purisima Point, CA, 1975, by Jim Cordy. Jim (1932 – 2018), a diver, wrote many articles for *Of Sea and Shore* and had the 2016 *Calliostoma* records for *gloriosum*, 35.4, and *variegatum*, 27.8. His 2008 record *Calliostoma mcleani*, 14.6, was replaced by 2016 with an 11.64 mm listing. The 2016 WRS *subangulata* listing was 14.46 mm.

Clearly, sometimes there is less to a WRS listing than the name would suggest. While the photo rule may have been well-intended, LOC records, responsibly gathered for decades prior to the WRS, should have been grandfathered. Regrettably, the records of notable figures have been erased. Printed prior to the photo rule, the 2008 WRS edition remains the best source for legitimate record size shells, unless a larger specimen is shown in the most recent WRS listing. The quest of the WRS may have been an ocean or shell too far. There may be value in having records gathered in a more regional manner, such as the LOC's coverage of the Eastern Pacific. A limited region like the Californian Province would be easier to manage, records would be under the review of local specialists, and entries could be more detailed. In closing, shell records are destined to be broken – by larger specimens.

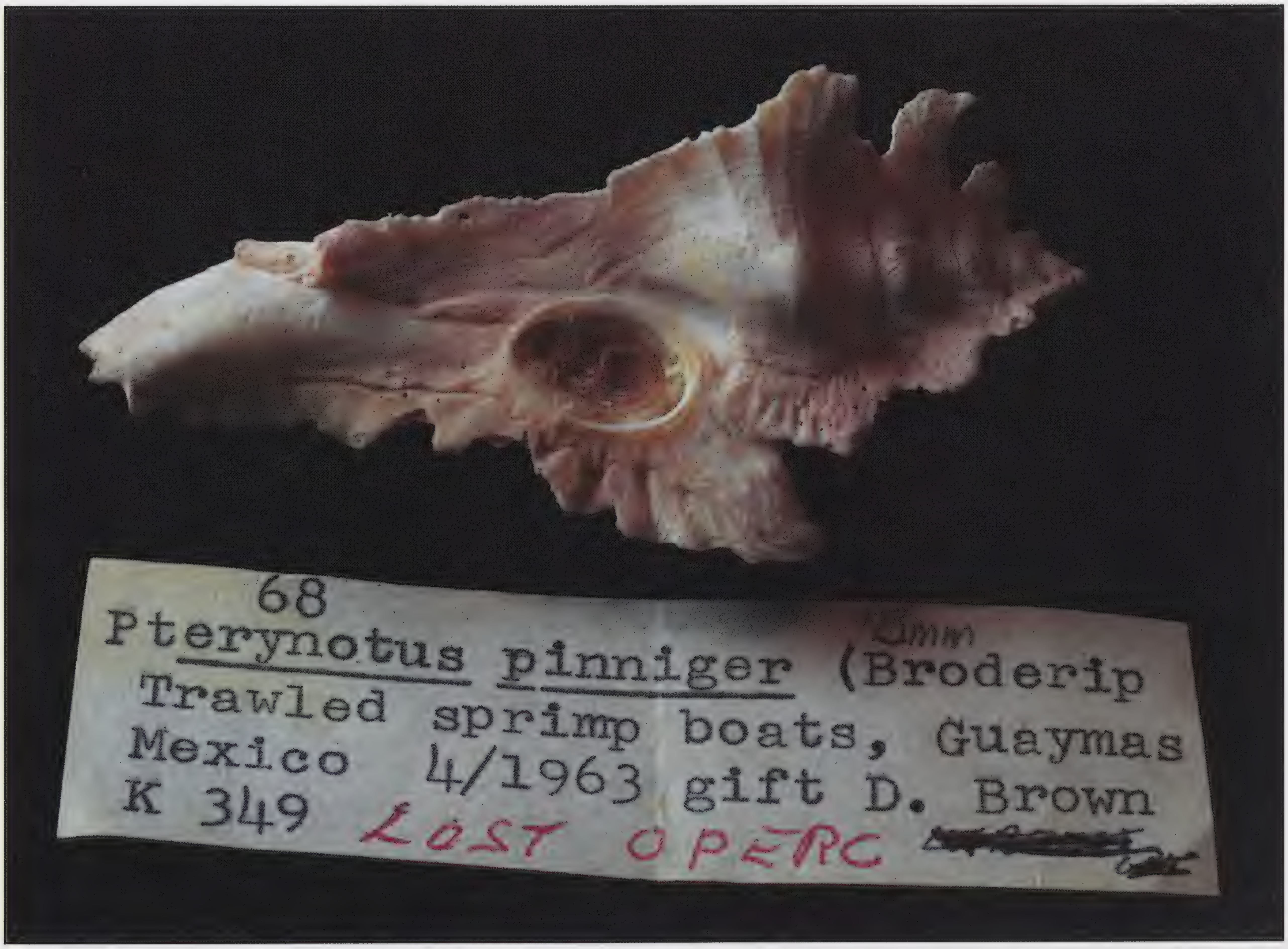

68
Pterynotus pinniger (Broderip
Trawled sprimp boats, Guaymas
Mexico 4/1963 gift D. Brown
K 349 LOST OPERC

Figure 1. *Pterynotus pinniger* (Broderip, 1833) - Ex Dorothy Brown Collection, the 1980 LOC at 71.5 mm. Note that the 1999 WRS measured 84.9 mm - which record was held by the late Peter Clarkson through 2008 WRS; *cf.* 2016 WRS at 59.9 mm.

Shell Collecting in Petersburg, Alaska

Tom Rice
Former editor and publisher at: Of Sea and Shore (1965-2013)
ofseaandshore@gmail.com

My friend, Roger Clark (Klamath Falls, Oregon) who had worked with me one summer (when he was 16 or 17) at my museum in Port Gamble, had been urging me to go on a collecting trip to southeastern Alaska. A good idea, I thought. So on May 23, 1994 Roger, myself, Drew Skinner (Anapolis, Washington) and George Holm (Vancouver, British Columbia) flew from Seattle north to Juneau, Alaska where we were joined by Aaron Baldwin (he was a student at the University of Alaska) and from there on to Petersburg, Alaska.

Petersburg was essentially a fishing-center, located on Mitkof Island. The only access was by boat or, as we did, by air. Petersburg, as does my hometown of Poulsbo, Washington, calls itself "Little Norway" and both celebrate Norwegian Independence (May 17) each year. We just missed Petersburg's 1994 event. It was raining on our arrival, but considering where we were from this wasn't unusual.

Our first good tide - we had scheduled the trip to include the lowest set of tides of the year reaching a minus 4.5 feet - was the next morning. We all arose early - the tide was shortly after dawn. But on reaching the beach were dismayed to see how little of the intertidal area was exposed. Had we misread the tide tables? Not to miss that fact we were at least on the beach we started looking for mollusks and soon discovered *Siphonaria thersites* on the bladder rack kelp and among barnacles in rock crevices. Since we seemed too early for the low tide, we ventured to a nearby cafe for breakfast - as we were to find out, meals in fishing towns such as Petersburg, are sized for hungry fishermen and loggers (one pancake fit a dinner-sized plate).

Figure 1. Petersburg, Alaska.

We were totally amazed as we again approached the beach to see that now, only 45 minutes later, there was indeed a good bit of intertidal area exposed. Our collecting area, at Roger's suggestion, was under a fish processing plant built on pilings and extending out into the Wrangell Narrows. Here we were excited to find *Neptunea lirata* alive and well, some perched atop their egg columns (these we left alone), in large numbers. This is usually a sub-tidal/deep-water species. Why were they here? The answer was above our heads - the fishing boats that brought their catch to the Petersburg plant and separated *Neptunea* from their catch and tossed them overboard as they unloaded the fish. The area must have pleased the gastropods and they established a thriving colony in this unusual location - we were not about to complain about that! In addition to the *N. lirata*, we found an occasional specimen of *Buccinum plectrum* and *Buccinum glaciale*. Aaron as rewarded for his diligence and collected a live *Epitonium greenlandica* as well as a *Trophonopsis tenuisculpta* and Roger, the "lucky one", found a beautiful *Boreotrophon stuarti*.

High on the pilings supporting the fish processing plant were hundreds of colorful *Nucella lima* in white, brown, orange and yellow - they certainly "stood out" as they clung against the muddy-brown pilings. Large and small *Cryptonatica aleutica* crawled about in the surface mud. A Cancellarid gastropod was found emerging from the mud as the tide started to rise; as did some *Colus halli*.

Closer towards the upper beach we also found the interesting *Volutharpa ampullacea*, covered in mud, we were amazed by the very tiny operculum of these animals, certainly it did not "seal" the aperture. Also among the mud-covered rocks were some *Buccinum baeri*, another addition to our growing Alaskan shell collections. Chased off the beach by the rising waters we returned to our hotel, tired, but looking forward to the next day's tide when we would visit a different beach.

Next day - raining still - we headed out of town to the north along the Wrangell Narrows to what appeared to be a "good spot." Other "collectors" were already there - 50 to 100 Bald Eagles sat atop boulders and in beach-side trees staring intently at the swiftly flowing tidal waters, oblivious to us, waiting to schools of herring to appear, as they indeed did. We found this beach a good place for chitons - *Schizoplax brandti*, *Dendrochiton flectrns*, *Tonicella insignis* and *T. lineata*. On the boulders we collected, very carefully so as not to chip their shells, several species of limpets - *Collisella* and *Lottia* in sizes much larger than those we were used to "down south." Standing back up, after returning the rock I had been examining to its original position was I delighted to see a group of four deer coming around the point. I stood still and they approached close enough to sniff my out-stretched hand.

In the afternoon we went via car - we rented one from the hotel - to explore a bit of the Tsongas National Forest, the largest of all the U.S. National Forests. Here we peered closely into rushing streams, quiet pools and among the muskeg to find, unsuccessfully, some mollusks.

We would return to each of the two collecting sports over the next few days of tides, collecting a few more of the species I have already mentioned. And over the next eight years, or so, I would bring others to Petersburg to show them the wonders of this beautiful area - especially the great shells "under the dock."

This does not conclude the telling of our Petersburg trip. The afternoon of the last day's tides, George, Arron and I decided we wanted to get some photos of the famous bears that inhabit Mitkoff Island. We were told they could easily been seen at the town's garbage dump, but we wanted to see, and photograph them in the "natural habitat." We had been told the place to do that was at "Woodpecker Cove" on the Forest Service road just off the main road to the south of Petersburg. So off we went. The main, paved, road ended about 15 miles from town and we then took the indicated hard-packed gravel side road into the hills. We carefully stayed on this "main road" - not tempted to go off on any side roads which we heard were not for "passenger" vehicles. After some time we had seen nothing indicating Woodpecker Cove and we finally decided it best to turn back.

The car's transmission had been acting "strange" the day before this outing, but the rental agency said not to worry, just use a lower gear - that seemed to relieve the problem. But now, as we started back, the transmission was badly slipping even in 2nd gear. We stopped and found that somehow a rock had pierced the transmission fluid line and that fluid was rapidly emptying onto the road. Rather than take the chance of damaging the car, we decided to walk back to the main road to get help - we had noticed a camping ground where we had turned onto the Forest Service road. We started backtracking, on foot, at 4:00 p.m. Our map and mileage signs along this road indicated we had 16 miles to go before reaching the camp grounds I mentioned. We just "knew" that at any moment another vehicle would come along and give us a lift back to "civilization." For the first five miles we covered a mile every 20 minutes. Then we passed a weed-covered sign pointing to a road off to the right and "Woodpecker Cove." We decided we'd look for bears another day - rather than meet them "eye to eye" so we continued on. We did see grouse, woodpeckers, porcupine, eagles and deer as our mileage-rate dropped to one mile per 30 minutes. We had not stopped in six hours! (Fortunately at this time of year, dusk in Petersburg occurs around 10 p.m.

Meanwhile back in town Drew and Roger became concerned when we did not return for dinner - something George, Aaron and I NEVER missed! We had planned a dinner at a seafood restaurant. At 8:00 p.m. they called Petersburg Police - who searched to end end of the town, some 9 miles - and the State Police - their lone trooper was off-duty, but they promised to launch a search in the morning, including a helicopter.

Back on-the-road we trudged along as the sun set. We wondered what we would do if we reached the campground and no one was there - it was another six miles to the fish hatchery. Finally we smelled smoke - the sun had set and it was getting truly dark - indicating we were approaching the end of the road and the campground, as well as someone was there.

As we reached the main road we saw headlights approaching from town and started to wave. The vehicle pulled over and it turned out to be Roger and his friend, Otto in Otto's pickup-truck. We were saved !!

We left Petersburg the next day, without our photos of bears-in-their-habitat, but with plenty of shell specimens to add to our collections and for exchanging with other collectors. We all vowed to return again another year - and we did do that and you'll eventually hear the stories of those trips in future anecdotes.

ISSN 0738-9388

Tonicella lineata (Wood, 1815) - the wonderful lined chiton of the Northeastern Pacific Coast

Roger N. Clark
Research Associate in Malacology, Santa Barbara Museum of Natural History
3808 Pinehurst Dr., Eagle Mountain, Utah 84005 insignis_one@yahoo.com

ABSTRACT The Pacific coast of North America is blessed with numerous large colorful chitons. One of the most beautiful and well known is the lined chiton, *Tonicella lineata* (Wood, 1815).

INTRODUCTION

The Pacific coast of North America has the richest and most varied chiton fauna in the world, with more than 120 species to be found from Alaska to California, and west Mexico adding more than 50 more species. This includes many large and colorful species. One of the most beautiful and variable is *Tonicella lineata* (Wood, 1815), the lined chiton, or lined red chiton.

For many years, *Tonicella lineata* was thought to be a single species, highly variable in size, shape and color, with juveniles living off shore and adults living in shallow water (Berry, 1917, Ferreira, 1983, Kaas & van Belle, 1987). However Clark, 1999 illustrated that *Tonicella lineata* is a member of a complex of five lined chitons on the Pacific coast, including: *Tonicella lokii* Clark, 1999, *Tonicella venusta* Clark, 1999, the remarkable *Tonicella insignis* (Reeve, 1847), and *Tonicella* new sp. *cf. T. undocaerulea* Sirenko, 1973. This last species was long considered to have amphi-Pacific distribution, but the North American "*undocaerulea*" differs from the Asian species in its much larger size, variable conchological characteristics, and different radular teeth. This new species is presently under description.

There are three characters that typically separate *Tonicella liueata* from its congeners by: 1) the red-orange background color, 2) the fine, black longitudinal lines, and 3) the gothic arch shaped lines on the head valve. Typically red-orange with alternating white and black lines, *T. lineata* is quite variable running from solid white to nearly solid red. The uniformly reddish, delineate form was named variety *fusca* (von Middendorff, 1847), also described from Sitka, Alaska.

Originally described from Sitka, Alaska, *Tonicella lineata* has a wide geographical distribution, from western Aleutian Islands to central California, a distance of several thousand kilometers. *Tonicella lineata* is abundant from the intertidal to about 10-15 m.

LITERATURE CITED

Berry, S. S. 1917. Notes on West American Chitons – I. Proceedings of the California Academy of Sciences, Fourth series, Vol. VII (10): 229-248.

Clark, R. N. 1999. The *Tonicella lineata* (Wood, 1815) species complex (Polyplacophora: Tonicellidae), with descriptions of two new species. American Malacological Bulletin 15(1):33-46.

Kaas, P. and R. van Belle, 1985. Monograph of Living Chitons (Mollusca: Polyplacophora). Vol. 2, Suborder Ischnochitonina, Ischnochitonidae, Schizoplacina, Callochitoninae and Lepidochitoninae. E. J. Brill/Dr. W. Backuys, Leiden. 198 pp.

Ferreira, A. J. 1983. The Familiy Lepidochitonidae Iredale, 1914 (Mollusca: Polyplacophora) in the Eastern Pacific. The Veliger 25(2):93-138.

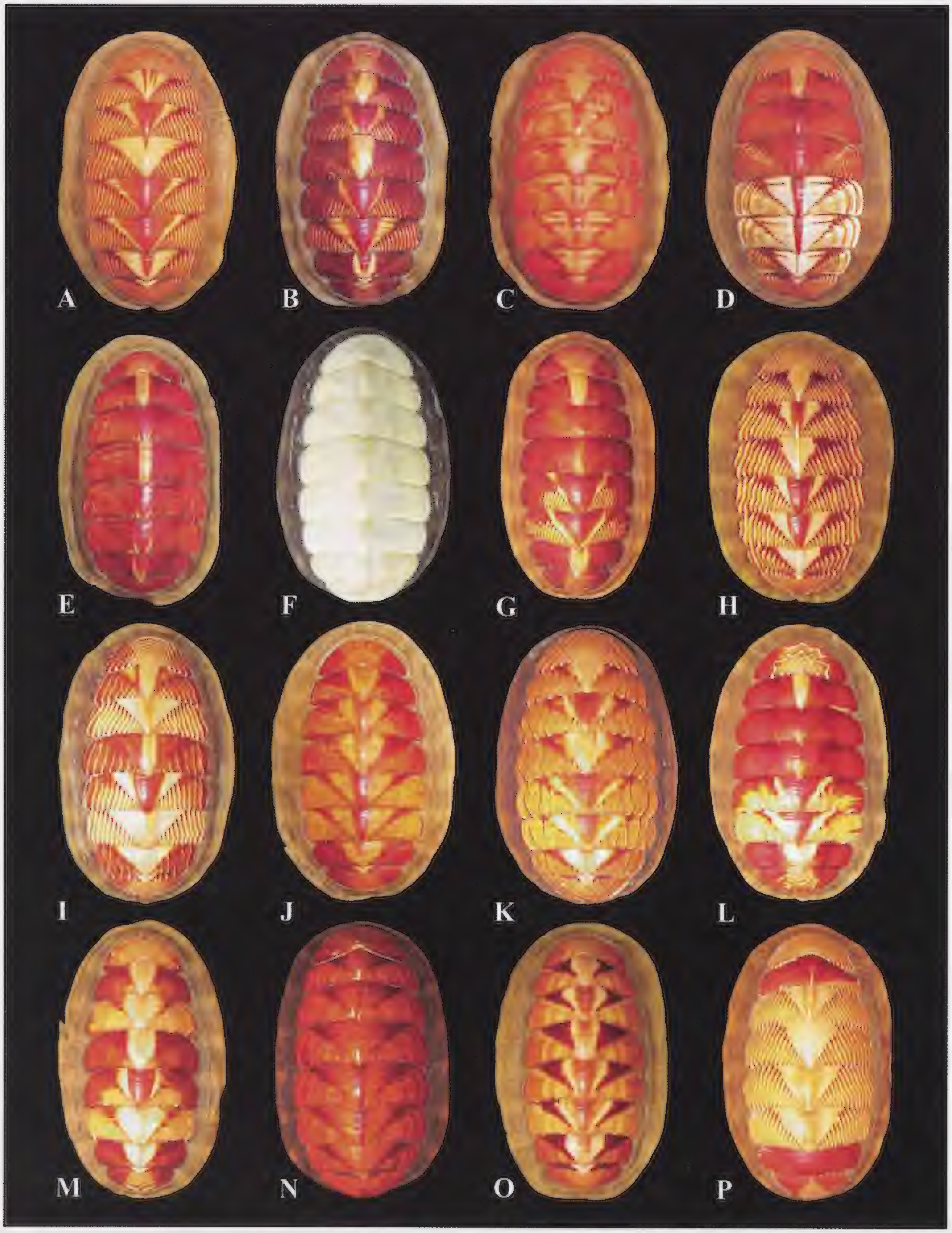


Figure 1. ***Tonicella lineata.*** **A=** RNC 2716, Tacoma, Washington, 40 mm; **B=** RNC 2716, Tacoma, Washington, 47 mm; **C=** RNC 2716, Tacoma, Washington, 38 mm; **D=** RNC 2716, Tacoma, Washington, 44 mm; **E=** RNC 2716, Tacoma, Washington, 39 mm; **F=** RNC 320, Victoria, British Columbia, 21 mm; **G=** RNC 1102, San Juan Island, Washington, 38 mm; **H=** RNC 1105, Victoria, British Columbia, 38 mm; **I=** RNC 1236, Gravina Island, Alaska, 33 mm; **J=** RNC 2711, Tacoma, Washington, 38 mm; **K=** RNC 970, Ketchikan, Alaska, 34 mm; **L=** RNC 344, Hadlock, Washington, 30 mm; **M=** RNC 1102, San Juan Island, Washington, 35 mm; **N=** RNC 934, Bowen Island, British Columbia, 38 mm; **O=** RNC 1106 Tacoma, Washington, 48 mm; **P=** RNC 901, Unalaska Island, Alaska, 40 mm.

E. adansonianus adansonianus (Crosse & Fischer, 1861),Bahamas, 106.1 mm. *B. poppei* (Anseeuw, 2003), Tonga Islands, 58.8 mm. *P. amabilis* f. *maureri* Harasewych & Askew, 1993, USA, 42 mm. *B. tangaroana* (Bouchet & Métivier, 1982), New Zealand, 55.9 mm. *P. quoyanus* (Fischer & Bernardi, 1856), Curaçao, 50.7 mm. *B. philpoppei* Poppe, Anseeuw & Goto, 2006, Philippines, 65.1 mm. *B. charlestonensis* Askew, 1987, Martinique, 77.3 mm. *B. midas* (Bayer, 1965), Bahamas, 82.7 mm.

YOUR CONCHOLOGICAL HOME ON THE NET

140,000 pictured specimens of common and rare shells for your collection.

Conchology, Inc. continues to develop its conchological goals by supplying worldwide collectors with the best quality and the best documented shells. Conchology, Inc. is powered by Guido and Philippe Poppe together with a dedicated staff of 24.

www.conchology.be philippe@conchology.be

Cebu Light Industrial Park, Basak, Cebu 6015, Philippines
Tel: +63 32 495 99 90 Fax: +63 32 495 99 91 www.conchology.be

Conchology, Inc.

Pisor's Shell House & Museum
[illegible] variety of unusual and unique items as
well as a large selection of Specimen Shells

Open by appointment only
[illegible] Clairemont [illegible]
San Diego, California 92117

Don & Jeanne Pisor
In business since 1970
Contact us at [illegible] or (619)729-2119
pisorshellhouse@gmail.com

E: vicmarshells@gmail.com

VIC-MAR
Shells
SPECIMEN TRADING

Vic Dungog

Cont. # : +63.917.5512639
LINE, WECHAT, WHATSAPP

Sitio Lupa, Punta Engano
Lapu-Lapu City, Cebu
Philippines 6015

P: +63.917.768.3223

Lyria kurodai

Fulgoraria ericarum

SINCE 1975

VIETNAMESE SHELLS

American
CONCHOLOGIST

Calendar membership (Jan - Dec) = $25 (USA)
Postal surcharges: + $5 for USA first class,
Canada & Mexico + $5, other nations + $15

New members apply to: Linda Powers
2700 N. Beach Road, Unit D106
Englewood, FL 34223-9223
linda.powers1@gmail.com

Quarterly Journal of the Conchologists of America, Inc.

30
YEARS
ANNIVERSARY

femorale

SUBSCRIBE TO
OUR WEEKLY LISTS
WE BUY OLD COLLECTIONS

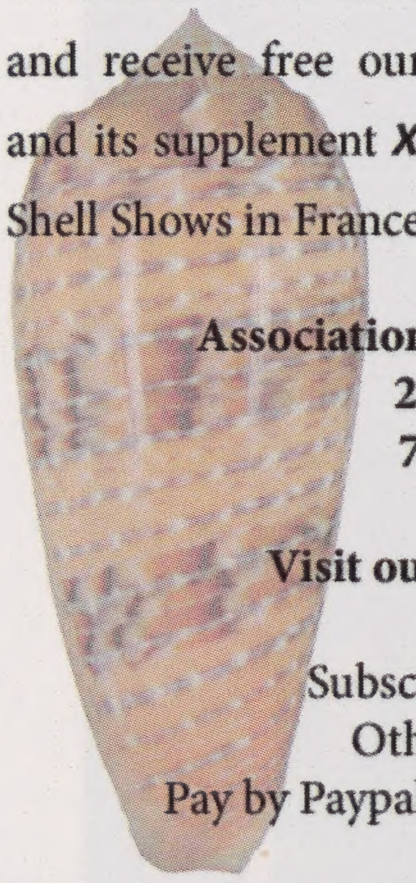
Jose & Marcus Coltro
www.femorale.com
shells@femorale.com

TEL: 619 507 8438

Charles Hames shelldoc@hotmail.com

PERTH SHELL DISTRIBUTORS
EST 1962
Showroom: 12 Ambrose St. Rockingham Western Australia 6168
Ph: (08) 9528 2722 Fax: (08) 9528 2733 Mobile: 0417 07 0010
Email: merv@perthshells.com Website: www.perthshells.com
PO Box 7037 Safety Bay
Western Australia 6169
Merv Cooper
Conchologist
- Diver -
Buyer & Seller of Worldwide Seashells
Complete Collections Purchased

Livonia mervcooperi



afc

Be a member of **AFC**, the French Conchological Association and receive free our quarterly Xenophora magazine and its supplement ***Xenophora Taxonomy***, enjoy our various Shell Shows in France all over the year.

Association Française de Conchyliologie
2 square La Fontaine
75016 Paris - France

Visit our site www.xenophora.org

Subscription Europe : 55 euros
Other countries : 65 euros
Pay by Paypal at souscription@xenophora.org

http://www.dedondershells.com
FERNAND & RIKA DE DONDER
Melsbroeksestraat 21
1800 Vilvoorde – Peutie
BELGIUM
Tel : +32 (0)2 253 99 54
e-mail : fernand.de.donder@telenet.be

WORLDWIDE SPECIMEN SHELLS

10 Minutes from Brussels Airport. Visitors welcome.
All Families from the very common to the ultra rare,
Worldwide shells : specialized in the smaller families, West Africa and European shells.
Free list on request, good quality shells at the best prices.

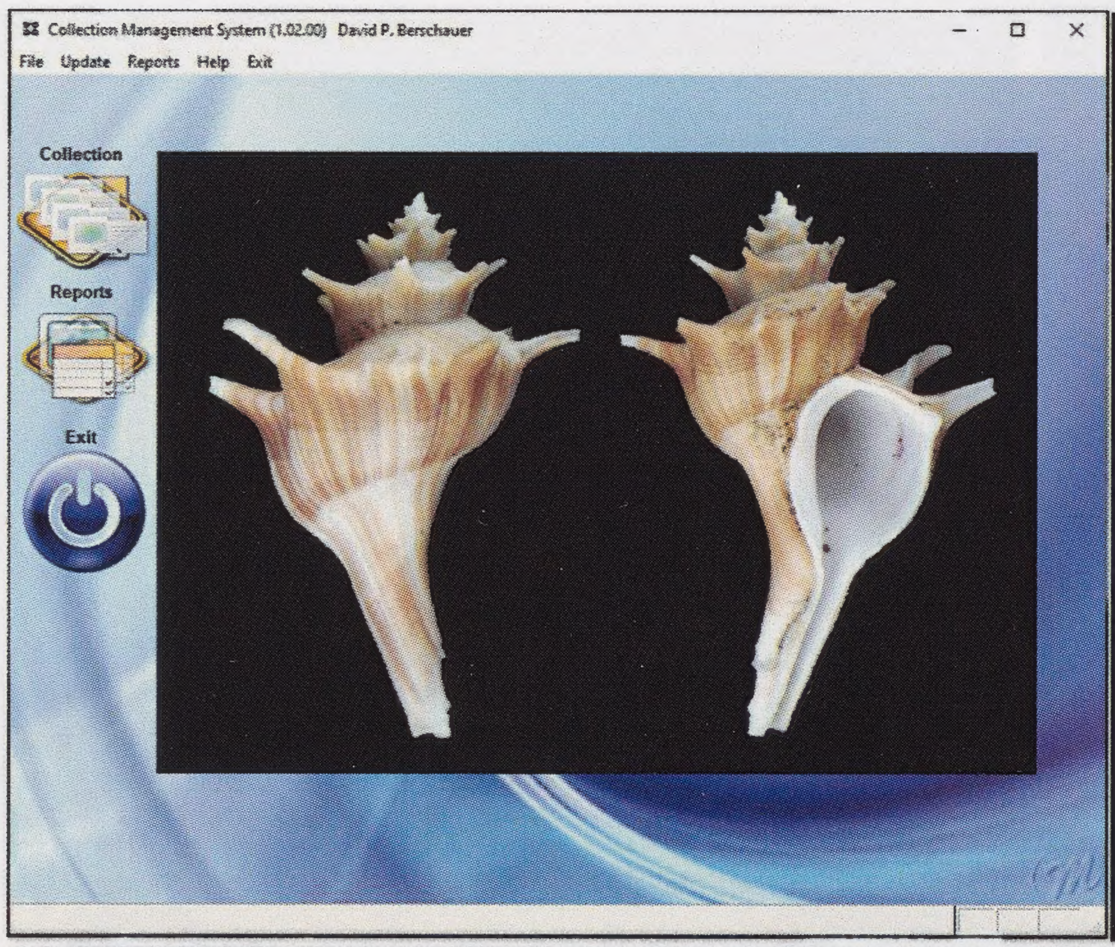
Algoa Bay Specimen Shells

Marginella hayesi

P.O. Box 97564
Northridge, Raleigh, NC 27624
http://www.algoabayshells.com/
(919) 931-6197 Brian Hayes
Contact: algoabayusa@gmail.com

SHELL COLLECTIONS WANTED
And also other Marine Life collections.
We will find good homes for your
shells ... many of which will be placed
in a Shell Museum of education
for children and others.
Call for a price evaluation.
Brian Hayes at: (919) 931-6197

PHILLIP CLOVER
Dealer in Specimen Since 1960 Worldwide Sea Shells Specializing
In Ancilla, Cancillaria, Conus, Cypraea,
Marginella, Mitra, Latiaxis, Morum, Typhis,
Voluta and Out-of-Print Shell Books
PH/FAX# 707-996-6960 Free lists
Email:clovershells@juno.com
P.O. Box 339 - Glen Ellen, CA 95442


Collection Management System (1.02.00) David P. Berschauer
File Update Reports Help Exit
Collection
Reports
Exit

Got shells? You need to keep them organized. *Collection Management System* is a museum style database program, which enables a collector to keep, organize, and maintain the individual records and data in a readily accessible form. The program is easy to use and is menu driven. Allows you to work with any systematic collection, print reports ***and labels***. Check out FB or our website www.shellcollections.com for more information. CD or downloadable versions are available.

Sea Shells of Southern California
Marine Shells of the Californian Province
David P. Berschauer and Roger N. Clark

Revised & Updated Second Printing = $35
Hardbound Collector's Edition = $50

Back cover: *Zacatrophon goliath* Houart and Löser, 2020. (Cover artistic credit: Rex Stilwill)

SMITHSONIAN LIBRARIES
3 9088 02040 4265